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Vol. XXIII, No. 1 JANUARY, 1934

JOURNAL
OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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THE 82nd ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN WASHINGTON, D. C.

The 1934 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conference of Pharmaceutical Association Secretaries, of the Pharmaceutical Law Enforcement Officials and the Plant Science Seminar will also be held in Washington.

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EVENTS OF PHARMACY IN 1933.

(See Historian's Report, November JOURNAL, page 1190.)

The outstanding event of American Pharmacy is the completion of the Pharmacy building in Washington—the American Institute of Pharmacy—"dedicated to those who have contributed their knowledge and endeavor to the preservation of public health and to the further advancement of science in pharmacy." The site is beautiful—the building faces the Lincoln Memorial; the historic river and Memorial Bridge may be seen from the building; also, the Washington Monument and part of the dome of the Capitol.

The Leadbeater pharmacy, in Alexandria, was purchased for the AMERICAN PHARMACEUTICAL ASSOCIATION; an association in Alexandria hopes to purchase the building and maintain the old pharmacy as a museum; if this Association is successful in raising sufficient funds, the fixtures, other articles and records will remain in Alexandria; otherwise, these will be placed in the headquarters building.

Pharmacy's exhibit at the "Century of Progress" interested the public, and the visitors obtained a better understanding of the service of pharmacy; many pharmacists were registered and quite a number of them were from foreign countries.

A symposium on "Practicing Professional Pharmacy" was an outstanding feature of the Madison meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION.

As all other activities, the drug industry is subject to codes applying to its several divisions. The code applicable to Retail Drug Establishments and to all Retailers dealing in drugs and allied products will be found on page 1071 of the October JOURNAL. A comment applying to pharmacists has been made by the Administration as follows:

"The terms 'registered pharmacist,' 'assistant pharmacist' and 'apprentice pharmacist,' as used herein (Code) shall have the meaning given to them under the laws of the respective states of the United States and of Alaska.

"A worker to be classified in this group must comply with the state law requirements for his position. The separate classification of pharmacists and professional persons is not intended to reflect in any way upon the recognized standing of pharmacists."

Legislation in Congress is under discussion which seeks to amend the Food and Drugs Act or create a new law. The AMERICAN PHARMACEUTICAL ASSOCIATION adopted the following resolution at its Madison meeting:

"*Resolved*, that the AMERICAN PHARMACEUTICAL ASSOCIATION records its approval of the proposed changes in the Federal Food and Drug Law in so far as they provide for more effective protection of the public health, and be it further

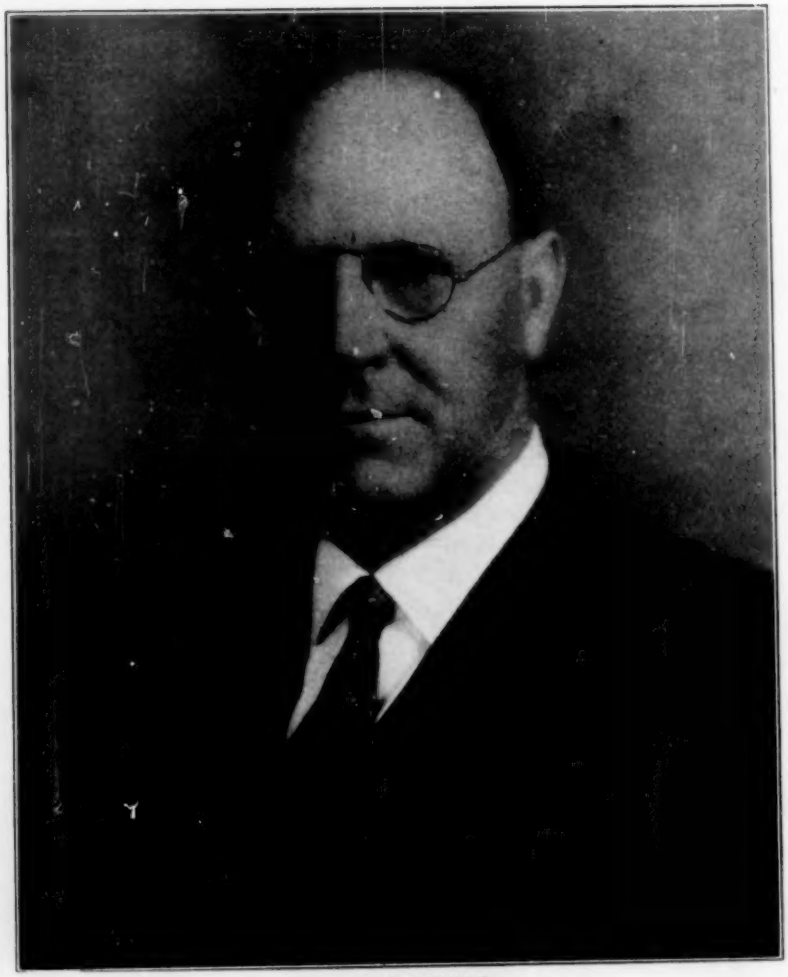
"*Resolved*, that in the interest of a sound public policy the delegation of arbitrary discretionary powers in connection with the enforcement of Food and Drug legislation be disapproved."

The reader is referred to the address of W. G. Campbell, Chief of the Food and Drug Administration in the October JOURNAL, page 1012; an editorial in the December JOURNAL; report on action by the Drug Trade Conference in the same number, page 1307.

The "Pharmaceutical Syllabus" has been revised, revisions of the "United States Pharmacopœia" and of the "National Formulary" are progressing.

The most important event in British pharmacy is the passing of the Pharmacy and Poisons Act. Every person registered as a pharmacist, shall, by virtue of being so registered, be a member of the Pharmaceutical Society of Great Britain.

Pharmacy Week was held during the week of October 9th.



L. D. HAVENHILL.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

Vol. XXIII JANUARY, 1934 No. 1

THE PRESIDENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY.

L. D. Havenhill, the thirty-third president of the American Association of Colleges of Pharmacy, was born in the town of Big Grove, Kendall County, Illinois, April 5, 1870. His early education was obtained in the Kendall County rural schools and completed in the West Aurora, Illinois high school, from which he graduated in 1887.

The years 1890–1891 were spent in gaining practical experience in an Iowa drug store. He entered the University of Michigan School of Pharmacy in the fall of 1891 and a year and a half later passed the Michigan State Board of Pharmacy examination for registered pharmacist, but following graduation he accepted the invitation of Prof. A. B. Stevens to remain as his assistant in pharmacy for the following year and to complete the work for the degree of Master of Pharmacy. This work was completed in June 1894, in time to accept a position of assistant chemist for a year in Honolulu with Dr. A. B. Lyons. While there he made some of the first chemical analyses of the rich sugar cane lands of the island of Oahu. Upon the completion of this work with Dr. Lyons he spent several months in the laboratory of the government chemist, Dr. Walter Maxwell. Upon his return to the states he was employed for a time in a pharmacy in Aurora, Ill., but later became assistant chemist for the Chicago and Aurora Smelting and Refining Company.

In the fall of 1899 he was appointed assistant professor of pharmacy at the University of Kansas, a position which he held until 1907 when he was granted a leave of absence to take a position as food and drug inspection chemist with the U. S. Department of Agriculture under Dr. H. W. Wiley and Dr. L. F. Kebler. After a year at the appraiser's stores in New York City, he returned to the University of Kansas School of Pharmacy as professor of pharmacy and pharmaceutical chemistry. Following the death of Dean L. E. Sayre, in 1925, he succeeded to the deanship.

Dean Havenhill is a member of the Kansas Pharmaceutical Association

and is its librarian. He is a member of the AMERICAN PHARMACEUTICAL ASSOCIATION (1890), the American Chemical Society and the Kansas Academy of Science, and has held important offices in each. He is a member of the honorary scientific society of Sigma Xi and the Gesellschaft für Geschichte der Pharmazie. He is a member of the Committee on Recipe Book and is serving his second decennial term on the Revision Committee of the U. S. Pharmacopœia.

He is director of drug analysis for the Kansas State Board of Health and member of the referee committee on livestock remedies for the Kansas State Board of Agriculture. He has contributed articles to various pharmaceutical journals and is the author of *Pharmaceutical Arithmetic*, 1912, *State Boards of Pharmacy Questions*, 1917, and co-author (with L. E. Sayre) of *Essentials of Pharmacy*, 1918.

A WORD OF APPRECIATION.

THE office of the AMERICAN PHARMACEUTICAL ASSOCIATION and of the JOURNAL has been in Baltimore for the past eight years. During this time the writer has received many courtesies and made quite a number of friendships which he hopes will continue for many years. Baltimore is known for its hospitalities and has a good pharmaceutical history; its pharmacists represent not only the ideals of pharmacy, but the members of the profession give expression to their views on important questions and seek to advance pharmacy and its service.

It is hoped that the foregoing words are proper in this place; certainly, they are expressive of the writer's appreciation.

OFFICERS-ELECT FOR 1934–1935.

The Board of Canvassers of the AMERICAN PHARMACEUTICAL ASSOCIATION, composed of W. F. Rudd, Chairman, W. G. Crockett and A. L. I. Winne, all of Richmond, Va., has announced as the result of the mail ballot for officers of the ASSOCIATION, the election of the following:

President, Robert P. Fischelis, Trenton, N. J.
First Vice-President, George D. Beal, Pittsburgh, Pa.
Second Vice-President, Oscar Rennebohm, Madison, Wis.
Members of the Council (for three years), H. A. B. Dunning, Baltimore, Md.; S. L. Hilton, Washington, D. C.; W. Bruce Philip, Washington, D. C.

These officers will be installed at the next annual meeting of the ASSOCIATION which will be held in Washington, D. C., the time to be announced later.

"Whether the alleged victim be the small industry or the small enterprise, the effect of the national recovery program on its functioning should be studied with most assiduous fact-finding and fault-finding. The recovery undertaking cannot be expected to remove all the competitive disadvantages of small size, but it certainly must not be allowed to aggravate them."—*Paint, Oil and Drug Reporter*.

EDITORIAL

E. G. EBERLE, EDITOR 2215 Constitution Ave., WASHINGTON, D. C.

WE GREET 1934 WITH HIGHER HOPES.

IN ENTERING a new year it is frequently the indulgence of the introspective to recall thoughts of past successes or linger on remembrances of evil days and bemoan prospects, based on deductions made by them. The value of both depends on whether the aim is to "carry on."

The year enrolled on the records of time has been an eventful one; unexpectedly, hidden or unknown conditions were brought to light and the great majority met with difficulties; the Government, with natural wealth, economic productiveness, potentialities of material prosperity, had to deal with problems that obtain in countries we consider less fortunate than our own. It was deemed necessary to apply methods to which the people of the United States were not accustomed; a study of them may bring the individual to conclusions, but in order to solve the problems it is necessary that all citizens do their part. Viewing the conditions of the earlier months of the past year and comparing these with the later—there is evidence of progress. True it is, that we have to submit to rules and regulations, methods and what not, many of which we do not understand; some prefer to say—"most of us do not comprehend." The inconveniences are many and the average citizen is disturbed by expenditures that seem beyond the possibilities of ever being adjusted; but, despite all of this, the inextinguishable impulse of our people is to believe that this year will be better than the last; somehow, the memories of the mistakes and disappointments of 1933 will be shaken off and we greet 1934 with higher hopes.

FOOD AND DRUG LEGISLATION IN CONGRESS.

SENATOR ROYAL S. COPELAND has introduced a revised food and drugs bill numbered S. 2000, based on the former bill, S. 1944. Many changes and additions have been made; among the latter, the creation of a Committee on Public Health and a Committee on Foods, each to consist of five persons appointed by the President "with a view to their distinguished scientific attainment and interest in public health" to assist the Secretary of Agriculture in preparing and amending regulations which must be approved by the majority of the appropriate committee. Provisions have also been included for hearings on regulations and for court review by injunction proceedings, of promulgated regulations.

Relative to labeling, the Copeland revision says "if its labeling is false or misleading in any particular; provided that no drug shall be deemed to be misbranded because of any representation concerning any effect of such drug if that representation is supported by substantial medical opinion or by demonstrable scientific facts." The "not a cure" provision in the definition of misbranded drugs has been entirely rewritten to require that the label show that the drug is a palliative and how and to what extent.

Congressman Loring M. Black, of New York, has introduced the bill of the National Drug Trade Conference to amend the present food and drugs act.

The purposes of the Conference in preparing the amendment were set forth by Representative Black; They are, in part, as follows:

1. Enlarge the definitions of the act so as to include devices and cosmetics.
2. Extend its provisions to include advertising.
3. Provide that notices of hearing shall be furnished to the manufacturer of the product, if known, and if unknown to the party who caused the article to be introduced in interstate commerce, instead of to the party from whom the sample was obtained, as provided in the present law.
4. The provision relating to the United States Pharmacopœia and National Formulary is amended to provide that the article shall not be deemed to be adulterated if the finished product complies with the pharmacopœial or National Formulary standards, without regard to the manner in which such product may be manufactured.
5. Cosmetics are deemed to be adulterated if they contain poisonous or deleterious ingredients in such quantities as are likely to be imminently dangerous to the user under prescribed conditions. This in lieu of provisions of Senate 1944, which provide in effect that the cosmetic shall be adulterated in case there is any remote danger of injury to persons with an idiosyncrasy.
6. The term, "package" or "original unbroken package," is defined as that intended for delivery to the ultimate consumer—that is, the retail package. The Supreme Court of the United States (McDermott *vs.* Wisconsin, 228 U. S. 115), has in effect indicated that under the present law such is the defined package of commerce.
7. "Label" and "advertising" in the amendment proposed by the National Drug Trade Conference are in effect the same as in Senate 1944.

THE PHARMACY AND POISONS ACT (GREAT BRITAIN).

THE British Pharmacy and Poisons Act became effective December 31st; under this Act every one (in Great Britain) at present registered as a "pharmaceutical chemist" or "chemist and druggist becomes a member of the British Pharmaceutical Society without any action having to be taken by him. The annual registration fee is £1, 11s., 6d. which includes a copy of *The Pharmaceutical Journal;* a provision, registering pharmacies, will come into force.

We quote from an editorial comment in *The Pharmaceutical Journal* on the effects of the Act "though the Act does not contain all that could be desired, even though it falls short of the expectations of the mildly optimistic, it is a gigantic step in the right direction. If it did no more than to compel every person engaged in the business of a chemist and druggist to bear his share of the cost of administration it would have been worth while . . . The essential constitution of the Society (British Pharmaceutical) remains unaltered. The Act strengthens not weakens the Society. Pharmacy remains a self-governing calling, controlled by a Council elected on a democratic basis, fixing its own qualifications, setting its own standards of education, regulating its own method and right of entry. The presence of three lay members—(the Privy Council may appoint three members of the Council and these need not, necessarily, be members of the Society)—will add to, rather than detract from, the powers of the Council."

Inspectors are provided for; anyone who is registered under the Act may be deprived of his certificate for misconduct.

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS.—*Chairman*, L. W. Rowe, George D. Beal, F. F. Berg, C. O. Lee, E. V. Lynn, John C. Krantz, Jr., Heber W. Youngken.

OXIDATION AND ANTIOXIDANTS.*

BY A. LEE CALDWELL AND FRANCIS E. BIBBINS.

One of the principal requisites of life, an indispensable, elemental necessity, is oxygen. We live by oxygen's favor only to spend our time and effort in an attempt to abate or prevent the damage done by this same element. Our food spoils and our property wastes away, in many instances due to the continual reaction which we know as oxidation. The first antioxidants were no doubt completely physical in their prevention of oxidation, such as pickling solutions, liquids or resins which protected some substance from contact with air. Our forefathers knew that their implements must be oil treated, lacquered or painted to preserve them, and we find that lacquer was used in China as a protective for buildings in the second century B. C., and a definite record of lacquer manufacture in Japan dates about A. D. 587. The lacquer used was an oxidizable substance extracted from a tree, *Rhus vernicifera*, and first oxidized to a yellow substance and then to a black.

An antioxidant is a substance which inhibits, prevents or stops the oxidation of some other substance or substances. This action is thought to occur in several ways.

By Inhibition.—Where the oxidation reaction is prevented by a substance which naturally repels the absorption of oxygen or takes up the oxygen which would combine with the substance being protected.

By Catalytic or Anticatalytic Action.—In which the antioxidant is regarded as a negative catalyst or a catalyst operating against change in the substance to which it is added. This catalytic action operates to cause a reaction to take some form other than the normal reaction with the principal substance involved.

By Chain Reactions.—In which the oxidizing reaction is viewed as one that starts and while going on gives off energy which in turn starts another reaction with the same results. The antioxidants operate to break up these subsequent reactions and stop this recurring chain.

These three conceptions while given here with titles to set them apart are not by any means entirely or distinctly different. There is some variation in viewpoint but each of them involves more or less a very kindred action. There are other theories which bear a connecting link between those just mentioned but are not sufficiently distinctive to continue to enumerate them.

Moureu and Dufraisse (1) have done quite extensive work on the study of auto-oxidation with the viewpoint that every reaction is a catalytic one, and there seems to be no legitimate reason to doubt that all auto-oxygenic or antioxygenic actions can be viewed from this standpoint. Whatever action takes place and by whatever means, it is easily resolved into one of catalysis. That every antioxidant is one that can be oxidized is seemingly very safe ground, especially when one

* Scientific Section, A. PH. A., Madison meeting, 1933.

considers that oxygen is oxidizable to ozone and acts as an inhibitor in the reaction between hydrogen and chlorine.

About twenty or twenty-five years ago considerable interest was aroused among chemists over oxydase, an enzymatic ferment, which was held as the principal causatory agent of oxidation in all products in which it was existent. Keegan (2) relates the observations of Lindet in 1893 regarding the oxidation of apple juice. It was found that the juice from boiled apples did not discolor in the air while the juice from fresh apples, cut and washed thoroughly with boiling water, did discolor. A conclusion was advanced that perhaps the vegetable tannin precipitated the oxydases. In the light of what we now know it seems more probable, however, that in boiling, a chemical reaction was responsible for some change in a natural constituent either destroying a pro-oxidant or forming an antioxidant. Such a conclusion has been reached by Overholser and Cruess (3) in their study of the browning of apples. They concluded that a peroxydase and an organic peroxide were responsible, and definitely detected the peroxide in fresh apple juice and could find no evidence of it in the boiled juice.

Lubimenko (4) observed, or detected, the formation of an antioxydase as a natural process during the ripening of the tomato.

It is well known that the heating or boiling of oils increases their susceptibility to oxidation. Especially is this practiced in the preparation of linseed oil, and in addition to boiling, traces of metals or metallic compounds have been added. Phokin (5) classified the activity of fifteen metals according to their activity as follows: *Group 1.*—Cobalt, manganese, chromium, nickel, iron, platinum, palladium. *Group 2.*—Lead, calcium, barium. *Group. 3*—Bismuth, mercury, uranium, cobalt, zinc. Observation of the increasing weight of a small sample is said to indicate the progress of the reaction.

Powick (6), in his study of the rancidity of fats, has given detailed consideration to the substances found in rancid fats with the idea of determining the agent responsible for the odor as well as seeking the agent responsible for the reaction in the Kreis test. Heptylic aldehyde is credited with the odor, and by spectroscopic methods the product of the reaction between acrolein and hydrogen peroxide has been found identical with that responsible for the color developed in the Kreis test, and identified as epihydrin aldehyde.

The Kreis test has had more or less discussion as to its reliability, and it may be said in regard to the work done in connection with this paper that the Kreis test was not depended upon except in a rough way. Powick found it unreliable in some cases and similar results have been obtained by many others. The Kreis test is performed by taking 5 cc. of the oil or fat to be examined, adding 5 cc. of concentrated hydrochloric acid, shaking thoroughly and then adding 5 cc. of 0.1% solution of phloroglucin in ether. A red coloration in the acid layer indicates rancidity. Holm and Greenbank (7) feel that the Kreis test is outranked by no other and are certain of its dependability. They do, however, state that the test does not indicate the degree of rancidity. Jones (8) regards the Kreis test as the best specific indicator of rancidity. But it is generally agreed that the degree of color is not proportionate to the rancidity, and that is the difficulty that has been encountered in the following experiments. The color developed is a very light pink in many cases and an indefinite pinkish brown in others, making it confusing in many instances

Richardson (9) reports that the test is not recommended for adoption by the American Oil Chemists Society. The most satisfactory results have been obtained in these experiments with a type of mercury manometer and a test in which a potassium iodide solution was used. Hyman and Wagner (10) used an alcoholic solution of potassium iodide and titrated the liberated iodine, after three minutes' standing in the dark, with 0.01 normal sodium thiosulphate, starch indicator. These authors state that an attempted manometric method gave erratic results and for this reason they abandoned it in favor of the chemical test.

Greenbank and Holm (11) concluded that methylene blue gave a good indication of the resistance offered by a fat to oxidation. We have found in this laboratory that the reduction of methylene blue in fats is very unreliable as to the powers possessed by an added antioxidant and if reliance were placed on this method, monoethanolamine would be quickly eliminated as a desirable antioxidant, however we are using it with great satisfaction in an aqueous solution of an organic mercurial.

In many instances refined oils and fats become rancid much more readily than the crude product and it has apparently been correctly assumed that refining removes some non-sterol portion which is a natural antioxidant.

TESTS USED IN DETECTION AND DETERMINATION OF OXIDATION.

The Methylene Blue Test.—Twenty cc. of fat are mixed with 1 or 2 cc. of a 0.025% solution of methylene blue in absolute alcohol. The use of alcohol other than absolute will introduce the factor of water in the experiment.

The Guaiac-Hemoglobin Test.—To a 10-Gm. sample add 4 or 5 drops of a one or two per cent solution of hemoglobin, 10 drops tincture guaiac and 10 cc. of distilled water. Allow to stand a few minutes when a blue color will be produced if oxygen has been absorbed.

The Kreis Test.—Has been given above.

Alcoholic Potassium Iodide Test.—To 5 Gm. potassium iodide add 10 cc. distilled water and ethyl alcohol 95% to make 100 cc. To a 5-cc. sample of the oil or melted fat add 5 cc. of this alcoholic solution and shake thoroughly, allow to stand about fifteen minutes and the alcoholic layer will appear as the supernatant liquid. It is essential that the samples for comparison be previously measured out and the addition of the potassium iodide solution be then made as near simultaneously as possible. Each sample is shaken the same length of time. The amount of color furnished by the liberated iodine will serve as an index to the amount of oxygen absorbed and the samples can be arranged accordingly.

Work in this laboratory was begun on cod liver oil, this being a very good example of a medicinal oil upon which feeding tests can be readily made, and also representative of a drying oil which will show resinous deposits or films when oxidized. From the latter standpoint work done upon linseed oil is applicable and considerable work has been done upon linseed oil and antioxidants. Mattill (12) has reported results with numerous chemicals both on lard and cod liver oil.

The first experiments undertaken were in connection with the antioxygenic activity of hydroxy-methyl-anethol, $CH_3.OH.CH_3CH.CH.C_6H_4O.CH_3$. Anethol is very rapidly oxidized even upon exposure to light, and since it is held more or less generally that the hydroxy compounds are a desirable class as antioxygens it appeared that this chemical might have satisfactory qualities.

Three 25-Gm. samples of cod liver oil were taken, plain oil, one containing 0.1% hydroxy-methyl-anethol (which for brevity will be designated as H. M. A.) and oil containing 0.2% H. M. A. Oxygen was slowly bubbled through the samples

and they were exposed to the light of a 100-watt lamp brought directly upon them. These samples were in a cabinet and were kept at a temperature of 35° C. The samples remained in this cabinet for a 24-hour period during which time 46–80 cc. of oxygen passed through each sample. Determinations were made for free fatty acids in an attempt to determine exactly the course of the reaction. The results follow:

Control	F. F. acids as % oleic	0.4022
Sample plain oil	F. F. acids as % oleic	0.4006
Oil with 0.1% H. M. A.	F. F. acids as % oleic	0.4089
Oil with 0.2% H. M. A.	F. F. acids as % oleic	0.4256

The results were too close together in the first three samples to make any conclusion whatever. The sample containing 0.2% H. M. A. did show that the induction of rancidity was definitely started.

Taking a new sample of cod liver oil, four 150-Gm. samples were taken, placed in a cabinet at 35° C. and exposed to the light of a 100-watt lamp for 27 hours. During this time oxygen was slowly bubbled through each sample until a total of 1600 cc. had been brought into contact with each sample of oil. Free fatty acid determinations were made (Col. 1) and the samples were set aside at room temperature in the dark, at the end of six months the samples were checked for free fatty acids (Col. 2).

The sample of plain oil was showing a film of oxidized oil on the surface, with a varnish-like deposit accumulating on the sides of the bottle at the surface. The control sample was in the same condition with approximately thirty per cent less oxidized deposit. The samples containing H. M. A. were free from any film or resinous deposit. The sample containing water was also free from any oxidized film. Both the control and the plain oil sample had a decidedly rancid odor while the other samples were comparatively free from this odor, the H. M. A. samples being best.

All of the samples were then kept in the dark, at room temperature, and at the end of two years, acidity determinations were again made (Col. 3).

Experiment "A."		1.	2.	3.
Control	F. F. acids as % oleic	0.379	0.6508	5.506
Sample plain oil	F. F. acids as % oleic	0.418	0.8606	6.809
Oil with 0.1% H. M. A.	F. F. acids as % oleic	0.427	0.6313	1.083
Oil with 0.2% H. M. A.	F. F. acids as % oleic	0.456	0.6603	2.085
Oil with 1.0% water	F. F. acids as % oleic	0.407	0.5751	1.040

The natural color was retained best by the sample to which water was added and was nearly as good in the sample containing 0.1% H. M. A. The sample containing 0.2% H. M. A. was slightly darkened, and the control and the plain oil sample were brown in color. The rancid odor was much greater in the control and plain oil sample.

Simultaneously with starting "A," 150-Gm. samples of the same oil were exposed to heat only, the temperature being 50° to 52° C. The control sample being the same as above.

Experiment "B."		End 1 Week.	End 1 Month.	End 6 Months.
Sample plain oil	F. F. acids as % oleic	0.4234	0.5051	1.448
Oil with 0.1% H. M. A.	F. F. acids as % oleic	0.4385	0.5320	1.131
Oil with 0.2% H. M. A.	F. F. acids as % oleic	0.4365	0.5170	1.286
Oil with 1.0% water	F. F. acids as % oleic	0.4079	0.5603	1.486

It will be observed, in the determinations made at the end of twenty-seven hours and at the end of one week, that the induction of rancidity is more rapid with the addition of H. M. A. and that the addition of water delayed this induction period. The determinations at the end of one month, on the heated samples, show the effect of the added water and the lesser acidity of the sample containing 0.2% H. M. A. The results are also shown for the end of a six months' period. The sample of plain oil showed a thick resinous film on the surface and resinous deposits on the sides of the bottle. The hydroxy-methyl-anethol samples were free from any film or deposit and the rancid odor was only about 25 per cent as great. The sample containing water was somewhat cloudy and had a pronounced rancid odor, but had only a slight deposit or resinous film on the sides of the bottle.

The apparent lengthening of the induction period, by the addition of water to cod liver oil, led to the washing of a sample of cod liver oil with three portions of distilled water. The volume of water used for each washing was the same as the oil volume. The oil was collected and filtered and samples were set aside for observation. At the end of eight months the following samples were observed:

Washed cod liver oil exposed to oxygen: Retained natural color, showed very thin film, and the odor was only approximately 50 per cent as rancid as the control. There was a slight deposit on the sides of the bottle.

Washed oil + 5 per cent added water: No film formed, a very slight deposit in bottle, 50 per cent, approximately, of rancid odor and a heavy white deposit in the bottom of the bottle.

Control: Dark yellow color, with a thin oxidized film, a strongly rancid odor and a small deposit on the sides of the bottle. Duplicate samples were held at 50° C. The control and washed-oil samples showed heavy gummy deposits, resinous in appearance. The washed oil + 5 per cent water showed no gummy deposit but did have a heavy film on the surface.

There is apparently some substance present in cod liver oil which can be removed or inactivated with water, thereby prolonging the induction period of oxidation. Perhaps in the sample washed with water, this substance reappears after oxidation begins and it may be that water present in the oil absorbs or hydrolizes this substance, thereby further preventing the oxidation.

COMPOUNDS FAVORED AS ANTIOXIDANTS.

The work done in all fields, for the prevention of oxidation has led to the establishment in general of favored types of compounds as antioxidants. Following are several of these more favored types: Phenolic compounds, hydroxy compounds, aldehydes, quinones, sterols, amines and alcohols.

Ammonium compounds, sugars, and in many isolated instances some other compounds have unexpectedly shown inhibitor action. Oxygen itself, acts as an inhibitor in the reaction between hydrogen and chlorine.

COMPOUNDS USED IN THIS EXPERIMENT.

A number of organic compounds were picked at random for determination of their antioxidant properties. Principally these compounds come under the classes named as favorable antioxidants. Flint-glass bottles of about one pint capacity were taken; in each bottle were placed 100 Gm. cod liver oil containing 0.5 per cent of the chemical, the bottles were filled with oxygen and stoppered tightly and connected to a mercury gage to measure the amount of oxygen absorbed. These bottles were set in a cabinet and a temperature of 58° to 60° C. was maintained. Two 100-watt lamps provided the heat, as well as light for whatever photochemical effect might be produced. The experiment ran for a forty-hour period and the following results show the absorbed oxygen, no regard being given to color developed.

Hydroxylamine Hydrochloride, $NH_2OH.HCl$	0.00 cc. O_2 absorbed in 40 hours
Alpha Naphthol $C_{10}H_7.OH$	0.50 cc. O_2 absorbed in 40 hours
p-Phenylenediamine, $NH_2C_6H_4NH_2$	3.90 cc. O_2 absorbed in 40 hours
p-Dimethylaminobenzaldehyde, $(CH_3)_2NC_6H_4CHO$	4.55 cc. O_2 absorbed in 40 hours
Thymoquinone, $C_6H_2O_2$ [1–4] CH_3 [2] C_3H_7 [5]	5.00 cc. O_2 absorbed in 40 hours
Blank Cod Liver Oil	5.05 cc. O_2 absorbed in 40 hours
Triphenylamine, $(C_6H_5)_3N$	5.15 cc. O_2 absorbed in 40 hours
p-Hydroxybenzaldehyde, C_6H_4OCHO	5.35 cc. O_2 absorbed in 40 hours

The *p*-Hydroxybenzaldehyde was in this case the least effective, oxidizing to such an extent in twenty-four hours that it was removed. This rapid indication of oxidation cannot be definitely regarded as disqualifying a chemical, for there are two views to be taken of the induction period. When an induction period is delayed or prolonged it may mean that the inhibitor used is one which will be protective by permanently preventing oxidation or it may be temporarily preventative and at the end of this temporary period oxidation may proceed with increased rapidity. A second view to take of the induction period is that when it is extremely short, it may be an indication that the chemical has a great affinity for oxygen and is taking up the oxygen for the protective benefit of the substance to which it has been added. From either viewpoint the possible value of the chemical cannot be definitely decided. Howeve., those chemicals which show a prolonged induction period are usually of value.

A second experiment, made in the manner of the one just outlined, using a different sample of cod liver oil gave the following results:

Alpha Naphthol, $C_{10}H_7.OH$	0.00 cc. O_2 absorbed in 40 hours
Blank (plain cod liver oil)	3.95 cc. O_2 absorbed in 40 hours
Benzophenone, $(C_6H_5)_2CO$	5.00 cc. O_2 absorbed in 40 hours
8-Hydroxyquinoline, $(CH:CH)C_6H_3.OH.N.CH$	5.05 cc. O_2 absorbed in 40 hours
Ergosterol, $C_{27}H_{42}O.H_2O$	5.10 cc. O_2 absorbed in 40 hours
Phenyl-alpha-naphthylamine, $C_6H_5.C_{10}H_6.NH_2$	5.10 cc. O_2 absorbed in 40 hours

Duplicate cod liver oil samples of 100 Gm. each, with 0.5 per cent of chemical added, were placed in an incubator at 50° C. At the end of one month the samples appeared as follows: No resinous film had formed in samples containing: *p*-Phenylene diamine; *p*-Dimethylaminobenzaldehyde; Hydroxy-methyl-anethol; Alpha-naphthol; Thymoquinone; Phenyl-alpha-naphthylamine; Beta-naphthol; Thymol.

A slight resinous deposit formed in samples containing: 8-Hydroxy-quinoline; Triphenylamine; Benzophenone.

A noticeable deposit of resinous character formed, on the sides of the bottles at the surface, in samples containing: *p*-Hydroxy-benzaldehyde; Menthol; Ergosterol; Hydroxylamine hydrochloride; Plain cod liver oil.

By the same method samples of olive oil were tested using:

Menthol, $C_{10}H_{19}OH$	0.00 cc. O_2 absorbed in 40 hours
Alpha-naphthol, $C_{10}H_7OH$	0.00 cc. O_2 absorbed in 40 hours
Blank	3.80 cc. O_2 absorbed in 40 hours

Further tests were made with olive oil, measuring the absorbed oxygen in the same manner and using 100-Gm. samples of oil containing 0.5 per cent of chemical. In this test the chemicals used were hydroxy compounds and organic acids.

Tartaric acid, $C_2H_2(OH)_2COOH_2$	0.00 cc. O_2 absorbed in 49 hours
Anisic acid, $C_6H_4.OCH_3.COOH$ [1:4]	1.70 cc. O_2 absorbed in 40 hours
Hydroquinone, $C_6H_4(OH)_2$ [1:4]	3.30 cc. O_2 absorbed in 49 hours
Pyrocatechin, $C_6H_4(OH)_2$ [1:2]	4.70 cc. O_2 absorbed in 49 hours
Benzoic acid, C_6H_5COOH	4.90 cc. O_2 absorbed in 49 hours
Resorcin, $C_6H_4(OH)_2$ [1:3]	5.00 cc. O_2 absorbed in 40 hours
Camphoric acid, $C_8H_{14}(COOH)_2$	5.10 cc. O_2 absorbed in 49 hours
Salicylic acid, $C_6H_4(OH)COOH$ [1:2]	5.30 cc. O_2 absorbed in 40 hours
Blank (plain olive oil)	5.30 cc. O_2 absorbed in 49 hours

It will be noticed that three of these samples (salicylic acid, resorcin and anisic acid) ran only 40 hours, they were removed at that time because they were the only samples which were showing absorption of oxygen. The induction period on all other samples occurred after the fortieth hour.

As a check on the oxygen absorption, 5 cc. of each sample were shaken with 5 cc. of alcoholic potassium iodide solution. As soon as the mixture separated into two layers the tubes were arranged in order according to liberated iodine shown. The order was:

1. Salicylic acid
2. Resorcin
3. Anisic acid
4. Camphoric acid
5. Benzoic acid
6. Blank

(3–4–5–6)

7. Pyrocatechin
8. Hydroquinone
9. Tartaric acid
10. Unexposed olive oil

Numbers 3 to 6, inclusive, were so nearly equal in color that it was not possible to determine the order of arrangement. It should be noted that this test gave very consistent results with the measured oxygen absorption, the greatest difference by measurement being 0.4 cc. between the benzoic acid sample and the blank. Anisic acid would without dispute hold position No. 3 when its induction period of forty hours is considered. Blank tests run by adding these chemicals to the alcoholic potassium iodide did not change the positions. It is also seen that while three dihydroxy benzenes were used, no consistent results were obtained in regard to the positions of the hydroxyl groups. Hydroquinone, with the OH groups in the 1:4 positions, is the best antioxidant and if wide separation of the OH groups is an advantage, resorcin should be better than pyrocatechin, such, however, is not the case. Blank tests should always be made with the alcoholic potassium iodide to determine whether or not the chemical under examination liberates iodine. In a

further experiment phloroglucin, $C_6H_3(OH)_3 + 2H_2O$, pyrogallol $C_6H_3(OH)_3$ [1:2:3] and tartaric acid were found very effective in the order named.

Some of these chemicals used in these experiments were not soluble in a proportion of 0.5 per cent, but the results are given regardless, for the insolubility in this proportion would merely indicate that a smaller amount would be necessary.

Rogers and Voorhees (14) in their work on gasoline have used a few of these chemicals, in addition to many others, and with favorable results.

Three compounds typical of as many chemical groups were taken for feeding tests upon white rats, and Vitamin A assays. These three compounds beta-naphthol, thymoquinone and hydroxy-methyl-anethol preserved the appearance of the cod liver oil as it was naturally, and prevented the formation of any resinous film. There was no apparent difference in the Vitamin A activity as compared with a control sample, indicating that there was no deleterious effect of the compounds on the vitamin activity. The compounds did not, however, aid in retaining the vitamin activity of the oil to give it any advantages over the control sample of the same age. Feeding tests upon a more extensive scale and with several of the other compounds used as antioxidants might show some that preserved the vitamin activity in addition to the physical characteristics of the oil.

CONCLUSIONS.

It can be stated definitely, that there is no absolute means of pre-determining the value of an antioxidant in oils and fats merely from the chemical structure of the compound.

Apparently the naphthols, quinones and hydroxy compounds are three of the most dependable types.

The "trial and error" method must be used to determine two things—*first*, the possible value of the antioxidant and *second*, the amount necessary to give the maximum activity.

While this paper involves only the use of antioxidants in oils, work done of a similar nature in aqueous solutions bring conclusions that parallel those just given.

Thanks are due to Charles R. Eckler for his work on the vitamin activity of the cod liver oil, and to W. J. Rice for criticisms.

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ELECTROLYSIS OF SODIUM IODOBISMUTHITE SOLUTIONS.*

BY A. E. JURIST AND W. G. CHRISTIANSEN.

Iodobismitol, a solution of sodium iodobismuthite and sodium iodide in ethylene glycol, has been shown by Hanzlik, Mehrtens, Gurchot and Johnson (1) to be of value in the treatment of syphilis. Sodium iodobismuthite has the empirical formula—Na_2BiI_5—and has been described by Nickles (2), Astre (3) and Draggendorf (4). Hanzlik has stated that the bismuth in this compound, more especially in Iodobismitol, is anionic, whereas most bismuth solutions contain cationic bismuth; the anionic character of the bismuth is reported as being related to the therapeutic efficacy of Iodobismitol. The present paper describes in detail a simple and rapid method by which the migration of the bismuth in Iodobismitol may be demonstrated; this method was suggested to us by Hanzlik.

APPARATUS.

The cell is a "U" tube having legs 20 cm. long and 7 mm. internal diameter. A stop-cock is sealed into each leg 15 cm. from the top; this cock makes it possible to fill the bottom of the "U" and the cocks with the solution to be tested, close the cocks, clean the upper part of each leg completely (this is essential) and fill the tubes above the cocks with any desired liquid so that there will be no traces of the test solution in the upper parts of the legs, *i. e.*, the electrode chambers, and so that the division between the test solution and the overlayering liquid will be sharp. When the cell has been filled, platinum screen electrodes which are connected to a 110 volt direct current are inserted into the liquids in the electrode chambers so that the bottom of each electrode is 7.5 cm. above the stop-cocks.

PROCEDURE.

Iodobismitol is placed in that portion of the cell between the stop-cocks, filling the cocks. The electrode chambers (the legs above the stop-cocks), after completely removing any traces of the Iodobismitol solution, are filled with 75% aqueous acetic acid. The electrodes are inserted, the current is turned on and the stop-cocks are carefully opened.

OBSERVATIONS.

1. *Current.*—At the outset the current flow is 0.21 m. a. but it gradually rises to 0.62 m. a. at the end of three hours.

2. *Migration.*—(*a*) Shortly after the current has been turned on the red Iodobismitol solution moves toward the anode and can be seen above the top of the stop-cock, whereas the level of the red Iodobismitol does not change on the cathode side.

(*b*) After two hours the red color has risen 2.7 cm. above the stop-cock on the anode side and a noticeable amount of iodine is liberated at the anode. No change is detectable in the liquids on the cathode side with the exception of a dark stain (bismuth) on the cathode.

(*c*) After three hours the amount of iodine liberated at the anode has become so great that the migration of the red Iodobismitol solution toward the anode is obscured.

3. *Chemical Tests Demonstrating Migration.*—The stop-cocks are closed and the current is shut off. The liquid surrounding the anode gives a positive test for bismuth and for free iodine. The black stain on the cathode is removable with aqua regia and the residue obtained by evaporating the aqua regia gives a positive test for bismuth.

The foregoing is the simplest and most rapid method for demonstrating the migration of bismuth during the electrolysis of Iodobismitol. The chief difficulty

* Scientific Section, A. PH. A., Toronto meeting, 1932.

with the method is the tendency of the liberated iodine to obscure the extent of migration of the colored solution toward the anode. This has been successfully avoided by using a different type of cell and different conditions as described below:

APPARATUS.

This cell (diagram 2) is specially designed to permit removal separately of the overlayering liquids in the electrode chambers, withdrawal of the iodobismuthite solution or addition of material (acid or sodium iodide) to the overlayering liquids or the iodobismuthite solution without disturbing the rest of the experiment. Also, the electrodes are so placed in special side arms as to prevent any material, such as iodine, liberated at the anode, from diffusing back and obscuring the phenomena to be observed during the electrolysis.

PROCEDURE.

A 1% solution of sodium iodobismuthite in ethylene glycol is placed in the "U" shaped portion of the tube between the stop-cocks. It is overlayered with a 0.2% sodium iodide solution in ethylene glycol 3 parts—water 1 part; the space

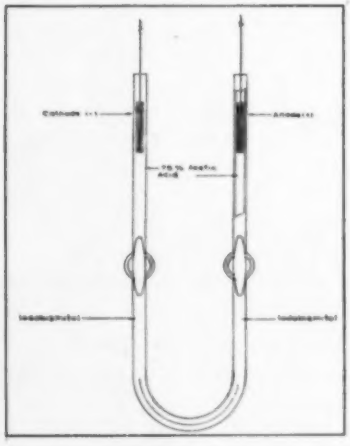

Fig. 1.

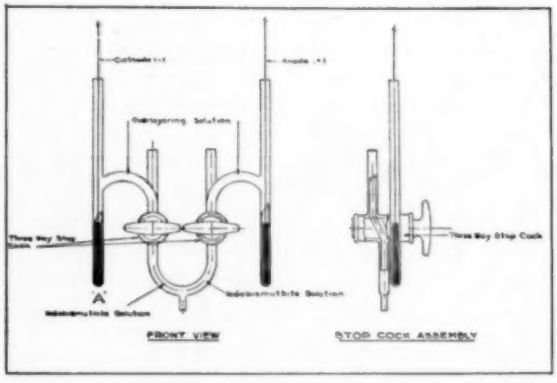

Fig. 2.

(A) surrounding the cathode is filled with $N/5$ hydriodic acid in ethylene glycol. After twenty-four hours' electrolysis the current has risen to a maximum of 0.12 m. a. and remains at this level. The cathode has a black stain on it as usual and the interface between the iodobismuthite solution and the liquid surrounding the cathode has dropped 2.5 cm. while the colored solution has migrated 3 cm. toward the anode which is surrounded by a brown color of free iodine. At this point the stop-cocks are closed and the solutions surrounding the anode and cathode are withdrawn. Fresh solutions are then substituted for them and the iodobismuthite solution remaining between the cocks is treated with sodium iodide equal to three-quarters of the amount originally present and thoroughly mixed. The current is again turned on. During the second twenty-four hours the current reaches a maximum of 0.4 m. a. and at the end of this period there is a depression of the interface between the iodobismuthite solution and the solution surrounding the cathode of 3.75 cm. Again there is migration of color toward the anode with much liberation of iodine at the anode. The solutions surrounding the electrodes are again

removed and replaced with fresh solutions and again the sodium iodide, 30 mg., is put into the iodobismuthite solution. The current is again turned on and the maximum during the third twenty-four hours is 0.4 m. a. At the end of the third twenty-four-hour period the appearance of the experiment is much the same as at the end of the second twenty-four hours. The electrolysis is allowed to proceed undisturbed for four more days, making a total of seven days. At the end of this period the current has fallen to zero, the interface between the iodobismuthite solution and the liquid surrounding the cathode is 2.5 cm. below the stop-cock and there is a noticeable black stain on the cathode. The anode is surrounded by a brown iodine solution and the colored iodobismuthite solution has migrated toward the anode to a large extent. The iodobismuthite solution remaining between the stop-cocks is extremely pale showing that most of the bismuth has been removed by electrolysis.

ASSAYS.

Bismuth in original iodobismuthite solution		5.9 mg.
Bismuth in anode liquid:		
(*a*) 1st stage	2.1 mg.	
(*b*) 2nd stage	1.6 mg.	
(*c*) 3rd stage	0.8 mg.	
Total	4.5 mg.	
Bismuth on cathode	0.4 mg.	
Unmigrated bismuth	1.5 mg.	
Total recovered		6.4 mg.[1]

[1] This figure, the sum of 5 separate assays, is 0.5 mg. above what it should be, due no doubt to limits of accuracy in the separate assays.

This procedure shows that most of the bismuth in the solution will migrate toward the anode if fresh electrolyte, sodium iodide, is periodically added. In this procedure anodic migration is not obscured by the presence of free iodine diffusing back into the iodobismuthite solution.

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RESEARCH DEPT. OF THE CHEMICAL & PHARMACEUTICAL LABORATORIES,
E. R. SQUIBB & SONS,
BROOKLYN, N. Y.

A. Ph. A. Resolution No. 3. Dispensing of Liquor for Medicinal Purposes.

Resolved, that the Officers and Council of the AMERICAN PHARMACEUTICAL ASSOCIATION be instructed to take such steps as they may deem necessary in the event of repeal of the 18th amendment, to prevent the sale of beverage liquor in pharmacies or drug stores, and be it further

Resolved, that it shall be the declared policy of the AMERICAN PHARMACEUTICAL ASSOCIATION to favor the dispensing of liquor for medicinal purposes only on physicians' prescriptions.

A REACTION FOR PHENOBARBITAL.*,[1]

BY GEORGE D. BEAL[2] AND CHESTER R. SZALKOWSKI.[3]

The tests described in the pharmacopœias of the United States, Great Britain and Germany direct the use of mercuric nitrate or mercuric chloride for the identification of barbital and phenobarbital. Since barbital, phenobarbital, dial (diallylbarbituric acid) and other barbiturates produce a white precipitate with both of these reagents it is the opinion of the authors that a more specific test is desirable in order to differentiate between the official compounds.

Barbituric acid derivatives are usually identified by recrystallization (1) and few chemical tests for their identity are described in the literature. Most of the tests are not specific and the presence of phenobarbital cannot be established with Millon's reagent, Denigès' reagent, phenylhydrazine and sodium nitroprusside, or sulphuric acid and naphthol.

Paget and Desogt (2) used Millon's reagent to differentiate allylbarbituric acids from other barbituric acid derivatives. Cobalt salts were used for the detection of barbiturates by Parri (3), Zwikker (4), Bodendorf (5), and Koppanyi *et al.* (6), but they did not prove them to be entirely specific. The murexide test, described by Handorf (7), is not sufficiently specific.

Ekkert (8) used formaldehyde and sulphuric acid to differentiate phenobarbital from barbital and proponal. He also (9) used selenious acid to distinguish phenobarbital from barbital. Cinchophen and neocinchophen show a similar reaction with selenious acid.

Lyons and Dox (10) employed *p*-nitro benzoyl chloride in the identification of alkylbarbituric acids. van Itallie and Steenhauser (11) reported the behavior of barbituric acid derivatives toward solutions of ammonium phosphate, bromine water, Schweitzer's reagent, silver nitrate and barium hydroxide.

Denigès (12) recrystallized the barbiturate and identified it by means of its crystal formation under a microscope. Zamporo (13) showed that phenobarbital produces a color with sodium nitrite in presence of sulphuric acid while barbital does not. Ramwez (14) nitrated the phenyl group and in this way was able to differentiate between barbital and phenobarbital.

David (15) was able to differentiate between barbital and phenobarbital in admixture by dissolving the sample in ammonium hydroxide and treating with hydrogen peroxide. He was able to show the presence of phenobarbital by the formation of a wine color. He has also described a reaction for barbital with alcohol, nitrous acid and sulphuric acid, afterward neutralizing with sodium hydroxide. Under his conditions barbital produces an orange-yellow color and phenobarbital a lemon-yellow. Lagrace (16) used vanillin in sulphuric acid to identify dial. This reaction is also obtained with allyl alcohol, terpenes, menthol, camphor and other similar compounds.

Mohler's (17) test for benzoic acid seemed to the authors to offer the possibility of differentiating between phenylated and non-phenylated barbiturates by

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* Scientific Section, A. PH. A., Madison meeting, 1933.

[1] Published by permission of the chairman of the Committee of Revision, U. S. P. XI.

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nitration of the phenyl group. Benzoic acid is converted to *m*-dinitrobenzoic acid by heating with sulphuric acid and potassium nitrate, made alkaline with ammonia, and reduced with colorless ammonium sulphide to the *m*-diamino compound, producing a red-brown color which changes to greenish yellow.

We have found that the following procedure will yield a definite reaction with phenobarbital that is not duplicated by any of the non-phenylated derivatives of barbituric acid.

In a large, hard glass test-tube mix 0.2 Gm. of the sample with 0.5 Gm. of potassium nitrate, and add 2 cc. of sulphuric acid. Heat the entire mixture in boiling water for twenty minutes, cool, and carefully add 3 cc. of distilled water. Make the solution strongly ammoniacal and boil gently to destroy any ammonium nitrite formed. To the cooled mixture, add without mixing 2 or 3 drops of colorless ammonium sulphide U. S. P. T. S.

Phenobarbital will show the formation of a reddish brown ring which diffuses and forms an orange color throughout the mixture. On heating, the color becomes a little more intense and finally becomes greenish yellow. Barbital does not give this reaction. Benzoic acid produces a reddish brown ring on the addition of the ammonium sulphide, but on heating becomes yellow-green

SUMMARY.

Mohler's reaction may be used to distinguish phenobarbital from barbital. The progress of the reaction differs slightly from that with benzoic acid. In the latter case the reddish brown ring diffuses to form a solution of the same color, and on heating changes to a yellowish green solution. With phenobarbital, on the other hand, the reddish-brown ring diffuses to form an orange-colored mixture which is turbid. Upon heating the color becomes more intense, shading into orange-red, and eventually becomes greenish yellow, the precipitate persisting.

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PITTSBURGH, PA.
September 23, 1933.

THE CHEMISTRY OF HEPTANE AND ITS SOLUTION.*,[1]

NO. 7. THE SOLUBILITY OF METHYLAMINE IN HEPTANE.

BY G. O. DOAK.

While studying the action of methylamine on arsenic trichloride in heptane solution, it seemed desirable to learn something about the solubility of the base in the hydrocarbon. For this purpose a commercial 33 per cent alcoholic solution of methylamine (Eastman Kodak Co.) was transferred to an Erlenmeyer flask connected with a reflux condenser, which, in turn, was connected with a calcium chloride tower and this with four flasks containing heptane surrounded by a freezing mixture.

In order to liberate the methylamine in the Erlenmeyer, it was not necessary to heat the alcoholic solution. A current of nitrogen, the rate of which was regulated by bubbling it through glycerin, released the base. Any alcohol carried over with it was held back in the $CaCl_2$ tower. The first receiving flask was regarded as saturated when methylamine escaped from the fourth.

The methylamine content of the heptane solution, after it had stood at room temperature (22°), was determined in 5-cc. portions as the platinum double salt and by titration. The amount of platinum obtained after ignition of the double salt revealed the amount of methylamine when computed after the formula $B_2H_2PtCl_6$ in which B, the base, stands for methylamine. In the titration, 5-cc. portions were shaken with 25 cc. of $N/100$ HCl (1) and the excess of acid titrated back with $N/100$ NaOH (2) using phenolphthalein as indicator. Duplicates by both methods gave the following results recorded as grams per cc. of heptane.

	Platinum Double Salt.	Titration.
1.	0.00109 Gm.	0.000595 Gm.
2.	0.00113 Gm.	0.000595 Gm.
Average	0.00111 Gm.	0.000595 Gm.

Hence the titration method yielded results 45.9 per cent lower than the platinum double salt method. Both methods were repeated, but in the titration method the methylamine was shaken out four successive times with four separate portions of $N/100$ HCl, namely, 25 cc., 15 cc., 5 cc. and 5 cc., respectively. This time the following results were obtained:

1.	0.00115 Gm.	0.00127 Gm.
2.	0.00112 Gm.	0.00125 Gm.
Average	0.00114 Gm.	0.00126 Gm.

Whereas the results obtained by the platinum chloride double salt method were essentially the same as those obtained before, the modified titration method gave much higher results than those obtained in the first series, indeed 9.6 per cent higher than the precipitation method.

* Scientific Section, A. PH. A., Madison meeting, 1933.

[1] From the laboratory of Edward Kremers.

In order to determine the solubility of methylamine in heptane at different temperatures, 5-cc. quantities were saturated with the base. Before shaking out the base with acid, nitrogen was passed over the heptane solution for 10 minutes to remove gaseous methylamine from the flask. The results of a duplicate series of determinations are herewith tabulated as grams per 1 cc. of solvent.

t.	I.	II.
40°	0.00024 Gm.	0.00024 Gm.
20°	0.00031 Gm.	0.00028 Gm.
10°	0.00048 Gm.	.....
3°	0.00072 Gm.	0.00081 Gm.
0°	0.00120 Gm.	0.00123 Gm.
−5°	0.00137 Gm.	0.00168 Gm.
−10°	0.00128 Gm.	0.00127 Gm.
−13°	0.00075 Gm.	0.00081 Gm.

Methylamine is reported to liquefy at −7° at which temperature it shows its maximum solubility in heptane, the solubility diminishing not only above this point, but below as well.

In order to check the solubility at the higher temperatures used, heptane was saturated at 0° and the temperature raised to 20° and kept there for 15 min. before 5-cc. portions were withdrawn for titration. The same performance was repeated at 40°. Again the results are tabulated:

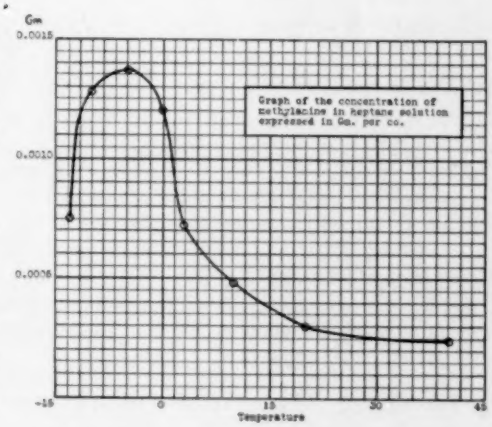

Fig. 1.

40°	0.000139 Gm.	0.000149 Gm.
20°	0.00027 Gm.	0.00028 Gm.

The accompanying curve reveals graphically the solubilities at different temperatures as already stated.

REFERENCES.

(1) The standard HCl was prepared by the method of a constant boiling mixture as described by C. W. Foulk and M. Hollingsworth, *J. A. C. S.*, 45 (1923), 1220.

(2) The standard NaOH was prepared by precipitating the carbonates from a concentrated solution of NaOH with barium chloride and diluting with carbon dioxide-free water in an atmosphere of nitrogen.

A. Ph. A. Resolution No. 11. Historical Material for Museum and Library of Headquarters Building.

Resolved, that the Local Branches of the AMERICAN PHARMACEUTICAL ASSOCIATION, State Pharmaceutical Associations, Boards and Colleges of Pharmacy as well as other organizations and individuals interested in the progress and development of pharmacy be urged to supply documents of historical interest, relics and museum material to the museum and library of the Headquarters Building of the AMERICAN PHARMACEUTICAL ASSOCIATION at Washington.

DETECTION OF GELATIN IN AGAR.[1,2]

BY GEORGE D. BEAL[3] AND CHESTER R. SZALKOWSKI.[4]

The U. S. P. X test for the detection of gelatin in agar reads as follows:

"A solution made by boiling 0.1 Gm. of Agar in 100 cc. of water and cooling yields no precipitate with tannic acid T.S."

This test has been reported to us as yielding a positive reaction with agar known to contain no gelatin. Agar belongs to the galactan group of carbohydrates and should not react with the protein reagents. In this investigation the effects of the common protein reagents on agar and agar adulterated with gelatin were studied.

EXPERIMENTAL.

Reagents.—The behavior of the following reagents upon solutions of agar and agar containing gelatin was determined: Copper sulphate T.S.; mercuric nitrate T.S.; tannic acid T.S., and also a saturated aqueous solution; picric acid T.S., a saturated aqueous solution and a saturated alcoholic solution; bromine T.S.; mercuric potassium iodide T.S.; phosphotungstic acid (1:10) and trichloracetic acid (1:4). The following special reagents were also used:

Millon's Reagent.—Dissolve 1 part, by weight, of mercury in 2 parts, by weight, of nitric acid and dilute with 2 volumes of distilled water.

Robert's Reagent.—Add 1 volume of nitric acid to 5 volumes of a saturated aqueous solution of magnesium sulphate.

Tanret's Reagent.—Dissolve 1.35 Gm. mercuric chloride in 25 cc. of water, add 3.32 Gm. potassium iodide dissolved in 25 cc. of water, dilute to 60 cc. with water and add 20 cc. of glacial acetic acid.

Samples.—Three samples of agar were available, all of which were asserted to be free from gelatin. The nitrogen content of the samples, determined by the Kjeldahl method, were:

Sample.	% *N*.	% Protein ($N \times 6.38$).
A	0.20	1.276
B	0.13	0.829
C	0.0355	0.226

These were used in the proportion of 1 Gm. dissolved in 100 cc. of boiling distilled water, and are designated as Solutions A, B and C.

Solution D.—1 Gm. of gelatin dissolved in 100 cc. of boiling water.

Solution E.—1 Gm. of Sample A containing 10% of gelatin dissolved in 100 cc. of boiling water.

Solution F.—1 Gm. of A containing 5% of gelatin dissolved in 100 cc. of boiling water.

Solution G.—1 Gm. of A containing 1% of gelatin dissolved in 100 cc. of boiling water.

Solution H.—1 Gm. of A containing 0.1% of gelatin dissolved in 100 cc. of boiling water.

Solution I.—1 Gm. of A containing 0.01% of gelatin dissolved in 100 cc. of boiling water.

Solution J.—1 Gm. of B containing 1% of gelatin dissolved in 100 cc. of boiling water.

Solution K.—1 Gm. of B containing 0.1% of gelatin dissolved in 100 cc. of boiling water.

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[1] Published by permission of the chairman of the Committee of Revision, U. S. P. XI.

[2] Scientific Section, A. PH. A., Madison meeting, 1933.

[3] Assistant Director, Mellon Institute of Industrial Research, Pittsburgh, Pa.

[4] Assistant in Research in Pure Chemistry, Mellon Institute.

All of the tests were performed at a temperature of 40–50° C. unless otherwise specified.

The tests and results may be described as follows:

Tannic Acid T.S. added drop by drop produced a pronounced turbidity in Solutions A, B and C, and a precipitate in the remaining solutions. The sensitivity was not especially changed by the use of a saturated solution of tannic acid.

Millon's Reagent added drop by drop produced a turbidity in Solutions A, B and C, and a precipitate in the remaining solutions, which became slightly pink on heating.

Mercuric Potassium Iodide T.S. and *Bromine T.S.* added drop by drop produced neither precipitate nor turbidity.

Phosphotungstic Acid added drop by drop produced a slight turbidity in Solutions A, B and C, and a white precipitate in the remaining solutions.

Trichloroacetic Acid produced no precipitate with the pure agars, nor when the gelatin concentration was 0.1% or less. In the presence of larger amounts of gelatin a white precipitate was produced.

Tanret's Reagent yielded no precipitate with the pure agars. A faint turbidity was produced by 0.01% of gelatin, while the higher concentrations formed a precipitate.

Robert's Reagent produced a precipitate only when the concentration of gelatin was 1% or greater.

Biuret Reagent.—To 5 cc. of the agar solution was added an equal volume of potassium hydroxide (1:4) and, after mixing, 3 drops of copper sulphate T.S. The solutions of pure agar showed only the color of the reagent. When 1% or more of gelatin was present the characteristic purple color of copper biuret was produced. With the lower concentrations of gelatin the blue color of the copper reagent was modified by a slightly purple tint.

Picric Acid T.S. was added dropwise to the agar solution and the mixture allowed to stand. Saturated aqueous and alcoholic solutions of picric acid were also added dropwise to separate portions of solution. A distinct yellow precipitate was formed in every instance when gelatin was present, while Solutions A, B and C remained clear.

CONCLUSION.

Tannic acid produced a precipitate with pure agar and as a result it cannot be used as a test for gelatin. Picric acid will precipitate gelatin but will not precipitate agar and is a very good reagent for the detection of gelatin. An alcoholic solution of picric acid is more sensitive toward the gelatin than an aqueous solution.

Tanret's reagent is not as sensitive toward gelatin as picric acid. It will precipitate gelatin but not agar. The biuret test is obtained with gelatin and samples of agar containing over one per cent of gelatin.

Millon's reagent is a common protein reagent, but all proteins do not react with the reagent. It will form a white precipitate with agar containing gelatin.

No precipitates could be obtained with the metallic salts. The best results were obtained with picric acid solutions and Tanret's reagent.

In the authors' opinion, the U. S. P. should prescribe the following test for gelatin in agar:

Dissolve 1 Gm. of Agar in 100 cc. of boiling distilled water and allow to cool to about 50° C. To 5 cc. of the solution add 5 cc. of picric acid T.S.; no turbidity appears within ten minutes (*gelatin*).

PITTSBURGH, PA.
November 9, 1933.

ORGANOLEPTIC BIOASSAYS.*,[1]

BY JAMES C. MUNCH, GEORGE E. BYERS AND HARRY J. PRATT.

"The tongue is more sensitive than the most delicate chemical reaction" (1). The literature on taste tests has been assembled (6).

The bioassay of capsicum has been proposed, studied in detail and adopted in U. S. P. X (2, 3, 4, 5, 7, 9, 10). As a result of investigations undertaken by one of us, a proposed modification of the U. S. P. X method has been published for consideration in the forthcoming XIth revision, (4, 5). This method is as follows:

"Shake 1 Gm. of coarsely powdered capsicum with 50 cc. of alcohol in a stoppered flask for 3 hours. Dilute 0.1 cc. of the clear, supernatant liquid with 100 cc. of 10% sucrose solution. Five cc. of this dilution swallowed during 5 seconds will produce the same degree of pungency in the throat as 5 cc. of 10% sucrose solution containing 16 mg. of piperine per L. In case 16 mg. of piperine per L. does not produce satisfactory pungency, the threshold concentration should be determined and corresponding alterations made in the standard for capsicum (0.1 cc. per 100 cc. or 20 mg. per L.)."

Further studies on this method have been made in a class of twenty-six students during the last year. It was found that very good agreements were obtained when proper recognition was given to the threshold of each investigator. The usual piperine threshold was 16 mg. per L. Two students showed consistently values of 15 mg. per L. Several others occasionally required concentrations of 17 or 18 mg. per L. However, by proper correction to a standard of 16 mg. consistent results were obtained in all cases. The suggested value of 20 mg. of capsicum per L. as a standard of pungency was met by five commercial samples tested at this time.

Four samples of commercial oleoresin were tested under the same conditions. A weighed amount of oleoresin was dissolved in 95 per cent alcohol to represent a dilution of 1 Gm. in 5 cc. and used for tasting, according to the method reported. The threshold of 3.5 mg. per L. previously recorded was met by all samples. Several of the samples previously reported (4), were re-tasted three years after the original assays, and no change in minimum effective concentration was observed. No change in the previous recommendation of 3.5 mg. of oleoresin of capsicum per L. appears necessary.

A few studies have been previously reported on the pungency of ginger and its oleoresin (2, 6, 8). The limit of pungency of Philippine Ginger ranged between 200 and 400 mg. per L. in ten persons who were not otherwise standardized (8). For the oleoresin, perceptible pungency was reported at a concentration of 3.3 to 5 mg. per L. (2).

In this investigation a series of commercial samples of crude ginger were obtained and made into fluidextracts. These were tested by dilution with 10 per cent sucrose solution, etc., following the method proposed for capsicum. The pungency was detectable on the tongue and cheeks as well as in the throat. These samples showed threshold values of 350 to 400 mg. of ginger per L.[2]

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* Scientific Section, A. PH. A., Madison meeting, 1933.

[1] Joint communication from the Department of Research, School of Pharmacy, Temple University, and Department of Pharmacology, Sharp and Dohme, Philadelphia, Penna.

[2] We wish to acknowledge our appreciation of the courtesy shown by Sharp and Dohme, Inc., of Philadelphia, in furnishing the material used in these investigations.

A few tests were made on the commercial oleoresins of ginger. Four samples were tested and found to produce a threshold pungency in concentrations of 5 mg. per L.

CONCLUSIONS.

1. A modified method for the bioassay of capsicum has been developed and proved successful in a series of assays by our students.

2. As standards of pungency it is recommended that 20 mg. of capsicum per L., and 3.5 mg. of oleoresin of capsicum per L. should produce the same degree of pungency as 16 mg. of piperine per L. (Threshold concentrations.)

3. This method is suitable for the bioassay of ginger and its oleoresin.

4. As standards of pungency threshold concentrations of 400 mg. of ginger and 5 mg. of oleoresin of ginger per L. are suggested.

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NOTES ON THE B. P. COLORIMETER TEST FOR ERGOT.*

BY F. A. UPSHER SMITH.

The color test for ergot devised by Maurice I. Smith (1) in 1930 soon found favor in Great Britain, so that it was adopted in the 1932 edition of the British Pharmacopœia.

Wokes (2) found that the test fails to distinguish between the inactive and active constituents of ergot. The four alkaloids, ergotoxine, ergotamine, ergotinine and ergotaminine, all gave the identical blue color with the Maurice Smith reagent when examined spectroscopically. In spite of the fact that this test does not measure solely the physiologically active substances in ergot, it was adopted for the following reason: The colorimeter test measures the total alkaloid with greater accuracy than the biological method measures the physiologically active alkaloid.

In the Report of the Sub-Committee on Ergot of the British Pharmacopœia Revision Committee (3), the conclusion was reached that the results by the bio-

* Scientific Section, A. Ph. A., Madison meeting, 1933.

logical test are lower than those given by the chemical methods; the ratio of the average results is 2 : 1. In setting the potency of ergot at "0.05% of the total alkaloids of Ergot, calculated as ergotoxine," the committee took into consideration the evidence which suggests that 60 to 70% of the total alkaloid consists of ergotoxine. Consequently, a total alkaloidal percentage of 0.05 is equivalent to an ergotoxine percentage of 0.03.

Up to the present time the majority of authorities have regarded either ergotoxine or ergotamine as the physiologically active constituent of ergot. The U. S. P. Cock's Comb method, the Broom-Clark epinephrin-reversal method, and the Maurice Smith colorimeter test all agree in valuing the ergot or its preparations according to the amount of alkaloid present. With this idea in mind, the fluidextracts of the U. S. P. and of the B. P. have been made with acidified diluted alcohol, in order to ensure as high an alkaloidal content as possible. The aqueous preparations of ergot, known to be deficient in alkaloid, have accordingly fallen into disrepute, in spite of the fact that the introduction of ergot into medicine was in the form of an infusion or decoction of the drug.

The consensus of opinion on ergot might, therefore, be held to favor the use of preparations containing the correct proportion of alkaloids, such as the fluidextracts of the U. S. P. and of the B. P., and to warrant the discarding of aqueous preparations of ergot, deficient in alkaloids. Strange to say, the situation has been complicated by the publication in June of last year of a paper by Dr. Chassar Moir (4), Obstetric Unit, University College Hospital, London, which has once more reopened the whole question as to what is the active principle of ergot. Working on human patients, Dr. Moir found that the effect of ergot when taken by mouth was to induce with remarkable rapidity strong uterine contractions, which lasted only for a limited time. This was in contrast with the known effect of ergotoxine, which is slower to start and more persistent in duration. Moir concluded that there must be in ergot some principle not previously isolated and identified. Dr. Moir found that the aqueous extracts and fluid preparations of ergot, even when old and containing at best but a trace of alkaloid, possessed the activity ascribed to this unknown substance. He found, however, that the B. P. liquid extract of ergot, which agrees closely in formula and composition with the U. S. P. fluidextract of ergot, also possessed this effect in about the same degree. It follows, therefore, that ergot contains an unknown active principle with a rapid but fleeting action, and alkaloids, such as ergotoxine, which are slower in action but more persistent. It is possible that the unknown principle initiates the contraction of the uterus, and that in turn the ergotoxine (or the ergotamine) carries on the contraction for a longer time. The search for Dr. Moir's unnamed active principle will be followed with interest. If its presence is confirmed, then the determination of the amount of alkaloid in ergot does not completely evaluate the drug.

Several investigators have published results of their work on the colorimeter test, including M. I. Smith and Stohlman (5), Swanson, Powell, Stevens and Stuart (6), Powell, Schulze and Swanson (7), Wokes (8), Swoap, Cartland and Hart (9), J. A. C. van Pinxteren (10), Allport and Cocking (11), Gerlough (12), Lozinski, Holden and Diver (13) and (14), and Smelt (15).

The author has tried the B. P. colorimeter test on several samples of ergot,

and compared results with those obtained by the Allport and Cocking modification. In the B. P. test as devised by M. I. Smith, the standard consists of 1 cc. of ergotoxine ethanesulphonate solution in water (containing 0.1 mg. of anhydrous ergotoxine) to which is added 2 cc. of a 1 in 800 solution of dimethylaminobenzaldehyde in 50% sulphuric acid v/v. The resulting blue colors are matched in a colorimeter. If the colors match, the sample contains 0.4% of alkaloids, calculated as ergotoxine.

The B. P. method of extraction consists in taking 12 Gm. of ergot in powder, defatting, and shaking the defatted powder with 120 cc. of ether for 10 minutes. Then add 0.5 Gm. of light magnesium oxide diffused in 20 cc. of water, and shake at intervals during 30 minutes. Now add 1.5 Gm. of powdered tragacanth, shake vigorously, filter through cotton, and transfer 100 cc., representing 10 Gm. of ergot, to a separator. The ethereal solution of the alkaloids is shaken with several portions of a 1% solution of tartaric acid, the ether removed by gentle heat and made up to 40 cc. One cc. of this solution represents 0.25 Gm. of ergot. When the B. P. method is followed on a hot day, there is difficulty in separating 100 cc. of ethereal solution.

Recently, Miss E. M. Smelt (15) has suggested a modification of the B. P. method of testing the fluidextract in order to prevent emulsification during the shaking with ether:

> Five cc. of the fluidextract are diluted with 25 cc. of distilled water, rendered slightly alkaline with 10% ammonia solution, and extracted with successive portions of 40, 35, 30 and 30 cc. of ether. The first portion of ether should not be shaken too vigorously, but less care is needed in shaking the subsequent portions. The ethereal solution is washed as directed in the B. P., and then extracted five times with successive portions of 4 cc. (or for strong liquids, 5 cc.) of a 1% solution of tartaric acid. After removal of ether, the solution is adjusted to 20 cc., or for strong fluidextracts, to 25 cc.

Allport and Cocking have insisted on the use of pure anesthetic ether, to avoid oxidation of the alkaloids.

The Allport-Cocking modification consists simply in adding a small amount of ferric chloride or ferric sulphate to the reagent. Using a 10% solution of ferric chloride, 5 cc. are diluted to 100 cc. with distilled water. The reagent is then mixed as follows:

Dimethylaminobenzaldehyde	0.125	Gm.
Sulphuric Acid, U. S. P.	65	cc.
Diluted Ferric Chloride solution	1	cc.
Distilled water to make	100	cc.

The advantage of this reagent consists in the full development of the color in about five minutes, even in the dark, so that prolonged exposure to light is unnecessary. In following the B. P. test, the solution, after adding the reagent, is warmed to 45° before exposure to light, but this is not necessary in using the Allport-Cocking reagent, as the temperature rises to about 45° on mixing the liquids. The solution should stand for at least 5 minutes before comparing the colors, in order to allow ample time for the color to develop. The following results were obtained with six samples of ergot, against a fresh solution of ergotoxine ethanesulphonate:

Sample.	B. P. Reagent.	Allport-Cocking Reagent.
1	0.170	0.171
2	0.210	0.191
3	0.082	0.073
4	0.100	0.090
5	0.145	0.134
6	0.236	0.222

(Results in Gm. total alkaloids in 100-Gm. ergot.)

The use of ergotoxine ethanesulphonate as a standard raises the question as to whether that standard is uniform from time to time. It seemed to be desirable to try to match this standard against a colored chemical solution. For this purpose an ammoniacal solution of cupric sulphate in distilled water was prepared. After numerous trials, it was found that a solution containing 0.67% of C.P. crystalline cupric sulphate or the equivalent amount of the desiccated salt matched a freshly prepared solution of ergotoxine ethanesulphonate containing 0.1 mg. of anhydrous ergotoxine in 1 cc. The similarity in color of the copper solution to the ergot solution treated with the B. P. reagent or the Allport-Cocking modification, is remarkably close. It is best to match the colors in daylight when using a Bausch and Lomb Duboscq colorimeter. The probable value of the use of a copper solution as a super-standard is seen in the following results. In one set of experiments the same ergot samples were matched (*a*) against a freshly made B. P. ergotoxine solution treated with the B. P. reagent; and (*b*) against an ammoniacal copper sulphate solution containing 0.67% of C.P. crystalline cupric sulphate:

Samples.	B. P. Ergotoxine Solution and B. P. Reagent.	Ammoniacal Cupric Sulphate Solution.
1	0.170	0.162
2	0.210	0.168
3	0.082	0.074
4	0.100	0.080
5	0.145	0.126
6	0.236	0.199

Another set of experiments was made, replacing the B. P. reagent by the Allport-Cocking modification, using the same samples of ergot.

Samples.	B. P. Ergotoxine Solution and Allport-Cocking Reagent.	Ammoniacal Cupric Sulphate Solution.
1	0.171	0.162
2	0.191	0.190
3	0.073	0.078
4	0.090	0.099
5	0.134	0.126
6	0.222	0.216

On the whole, these two sets of experiments show a fairly close agreement and suggest that the copper standard may have a useful function.

It would be a distinct advantage if we could check up our ergotoxine standard against such a fixed standard, easily obtainable. It would guard against using an ergotoxine salt or a solution of the same that had deteriorated. The long-continued heat has delayed some of the experimental work that was planned, due to the

difficulty of handling the ether solutions on an aliquot basis. These preliminary observations as to the use of copper sulphate as a check on the standard are offered in the hope that others may try it, and possibly improve on it.

Recently, R. Freudweiler (16) has suggested the use of a 2% solution of vanillin in concentrated sulphuric acid (free from nitric acid) in place of the B. P. reagent. When 2 cc. of the vanillin reagent are added gradually to 1 cc. of an aqueous solution of the alkaloids of ergot, a purple color develops, which is stable for hours, and under the given experimental conditions, its intensity is proportional to the amount of alkaloid present. Equimolecular proportions of ergotoxine, ergotamine and ergotinine are stated to give equal intensities of color. Allport and Cocking (11) tried vanillin (and other aldehydes) in place of dimethylaminobenzaldehyde, but found none of them developed a color without exposure to bright light. In trying out this reagent it was found that the temperature ran up quickly to 93° and in one case to 98°. On adding the reagent to the ergotoxine solution surrounded by cold water, a temperature of 72° was reached. A wine-red color was developed.

A solution was then made of 2% vanillin in 65% v/v of concentrated sulphuric acid. The color when fresh was bright golden yellow, but by the next day the bright gold effect had given way to a dull yellow. On adding this solution to the ergotoxine, the temperature rose to 45–52°, without using precautions to keep the solution cool. This temperature is not considered too high for the alkaloids. The color of the solution was a beautiful purple. But it was found a difficult color to match in the Duboscq colorimeter, either by daylight or artificial light, showing rose-red, and lacking the bluish or purplish tint of the ergotoxine solution. The following figures give the results with the same samples of ergot as before, tested against a fresh solution of ergotoxine with the same reagent:

Sample.	2% Vanillin in 65% Sulphuric Acid v/v.
1	0.148
2	0.167
3	0.069
4	Not tested
5	0.109
6	0.174

Combining all results into one table, the following figures make it easy to compare results:

Sample.	Sample and Ergotoxine Sol. Treated with B. P. Reagent.	Sample Treated with B. P. Reagent Compared with Cu Solution as Standard.	Sample and Ergotoxine Sol. Treated with Allport-Cocking Reagent.	Sample Treated with Allport-Cocking Reagent Compared with Cu Solution as Standard.	Sample and B. P. Ergotoxin Solution Treated with 2% Vanillin in 65% H_2SO_4 v/v.
1	0.170	0.162	0.171	0.162	0.148
2	0.210	0.168	0.191	0.190	0.167
3	0.082	0.074	0.073	0.078	0.069
4	0.100	0.080	0.090	0.099	Not tested
5	0.145	0.126	0.134	0.126	0.109
6	0.236	0.199	0.222	0.216	0.174

(Figures represent Gm. of total alkaloids in 100-Gm. ergot.)

In so far as I have used these reagents, I much prefer the Allport-Cocking reagent to vanillin. The colors are easier to match, and this reagent has given satisfaction in the hands of many workers in several countries.

It is to be hoped that the continued use of the Maurice I. Smith colorimetric method, as modified by Allport and Cocking, will prove to be a trustworthy guide as to the potency of ergot since it affords a simple means of checking biologic assays. There is need of further work on the relative values of results obtained by chemical and biologic methods of assay now in use. The papers published by Lozinski, Holden and Diver (13) and (14) are a step in the right direction.

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MINNEAPOLIS, MINN.

YEAST EXTRACT IN PILL MAKING.

Various yeast extracts are found to be suitable for pill making. Ext. faecis sicc. (D.A.B. VI) is used in conjunction with glycerinated water in pil. arsen. (0.001 Gm.), pil. creosoti (0.025 mil.), and pil. ferri redact. (0.05 Gm.). If the proportion of the powdered ingredients becomes too large for a satisfactory pill-mass to be made with the dry extract, a small quantity of ext. faec. spiss. (D.A.B. VI) may be added. For this purpose a mixture of equal weights of yeast extract, glycerin and water is kept ready and used as required; in this way the binding power of the dry extract is increased and a higher proportion of powders may be incorporated. Examples include quinine hydrochloride and salol with equal weights of dry and moist extract of yeast. The dry extract is suitable for preparing pills of ethereal oils, balsams, etc., and the pills are more soluble than when prepared with lanolin and kaolin, etc. Ext. faec. spiss. or powdered yeast dried at 100° C. may be used with the dry extract. The powdered yeast is superior to liquorice powder as a binding agent, and pills made with it more readily disintegrate, owing to absorption of moisture with consequent swelling. Examples quoted are for turpentine ((0.25 Gm.), santal oil (0.5 Gm.), and balsam of copaiba (0.5 Gm.), with 4 Gm. of dry extract and 8 Gm. of powdered yeast for 100 pills. If the pill formula already contains a soft extract, *e. g.*, extract of gentian, the yeast extract may be omitted.—R. Ruf (*Pharm. Weekbl.*, 33 (1933), 880).—Through *Pharmaceutical Journal*.

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Compiled by A. G. DuMez, Reporter on the Progress of Pharmacy.

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"After all the argument and disputation, after all the theory and doctrine, after all the study and analysis, the conclusion of the whole matter is this, that a professional does not live unto himself alone and what he does carries an influence far and wide."

EPHEDRINE SALTS OF FATTY ACIDS AS SOLUBILIZING AGENTS IN MINERAL OIL SYSTEMS.

BY E. E. MOORE.*

It is well known that many alkaloids which are insoluble in mineral oil dissolve in mixtures of mineral and vegetable oils. The importance of the free fatty acids present in the latter has not been fully recognized. A good grade of olive oil will contain about one per cent free fatty acid. Because of its alkaline nature the alkaloid can combine with this free acid to form a salt. The latter is not only much more soluble than the original alkaloid in mineral oil but the resulting solution has much greater solvent power than the original oil. In this work the formation of ephedrine salts of fatty acids and the solvent action of their solutions in mineral oil were studied.

The purpose of this investigation was to prepare a mineral oil solution of ephedrine, a secondary aliphatic amine, and metaphen, an acidic organo mercurial.

Solutions of ephedrine and acidic organo mercurials in vegetable oils may be readily prepared. Investigation indicated that these were not true solutions, but colloidal suspensions. They exhibit the characteristic Tyndall beam, and t e interfacial tension between the oil solution and water is lowered so that emulsions can easily be formed.

These facts suggest that the system may be stabilized by a compound formed between the ephedrine and some substance present in the vegetable oil, presumably the free fatty acid. The system would then consist of oil as the continuous phase, the amine salt of the mercurial as the discontinuous phase, and the amine soap at the interface as the stabilizing agent.

Solubilities were studied in olive oil containing one per cent free fatty acid, neutral olive oil, and neutral methyl and ethyl esters of the fatty acids of olive oil. Ephedrine is soluble in all the above oils, while metaphen and metaphedrin, formed from one mol. each of ephedrine and metaphen, are insoluble.

An excess of ephedrine was added to suspensions of metaphen and of metaphedrin in the different oils. Only in the case of olive oil did solutions result. The rate of solution was much more rapid with the metaphedrin than with the metaphen, which indicates that the amine salt of the organo mercurial must form before the latter can dissolve.

When one per cent of oleic acid was added to the neutralized oils, they behaved like the olive oil. Solutions resulted under the same conditions.

Mineral oil was then tested. When one per cent of oleic acid was added, solutions resulted as readily as with olive oil. Further work showed that the oleic acid content could be reduced. Preparations containing 0.1% oleic acid, 1.0% ephedrine, and 0.04% metaphen show no signs of separation after two years.

Other acidic organo mercurials such as mercurosal, merthiolate and mercurophen were found to behave like metaphen in this respect. Acidic organo metallic compounds other than mercurials were used. Other amines which form oil-soluble soaps, such as the ethanolamines (1) can be used in place of ephedrine. The unsaturated fatty acids of high molecular weight, oleic and erucic, give the most stable systems.

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The rate of solution was estimated by the color development, while completeness of solution and stability were determined by analysis for mercury (2).

The most satisfactory method of preparation consists in first forming the ephedrine salts of the mercurial and of the fatty acid and then stirring these into the oil.

The concentration of mercurial which may be obtained is limited by the requirement that on an average four mols of the ephedrine salt are required for each mol. of the mercurial amine salt. Stable preparations containing 1.0% of the latter have been made.

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A COMPARISON OF THE EFFECT OF PHENYL ETHANOLAMINE AND EPHEDRINE ON NASAL MEMBRANES.*

BY T. B. GRAVE AND W. G. CHRISTIANSEN.

Ephedrine solutions are widely used for application to nasal membranes, and Tainter (*J. Pharmacol. Exper. Therap.*, 36 (1929), 52) described the satisfactory behavior of phenyl ethanolamine on nasal membranes. It was, therefore, of interest to prepare phenyl ethanolamine for comparison with ephedrine. The phenyl ethanolamine was prepared by methods described in detail below and was tested as the hydrochloride in 1, 2 and 4% aqueous solution and as the oleate in mineral oil solution using in both cases corresponding ephedrine solutions as controls. The solutions of the oleates were prepared by dissolving 5 Gm. of the base with a chemical equivalent quantity of oleic acid in mineral oil so that the total volume was 100 cc. The tests consisted of applying these solutions to the nasal membranes of both horses and human beings and observing the degree and duration of blanching and recording in the experiments on human beings the relief. As a result of these tests we conclude that there is little difference between the phenyl ethanolamine and ephedrine.

EXPERIMENTAL.

Preparation of ω-Aminoacetophenone.—$C_6H_5.CO.CH_2Cl + (CH_2)_6N_4 \longrightarrow C_6H_5.CO.CH_2.[(CH_2)_6.N_4].Cl.$

$C_6H_5.CO.CH_2[(CH_2)_6.N_4].Cl + 3HCl + 12C_2H_5OH \longrightarrow C_6H_5CO.CH_2.NH_2.HCl + 3NH_4Cl + 6CH_2.(OC_2H_5)_2$

The method of Mannich and Hahn, *Ber.*, 44 (1911), 1542, was used.

23 Gm. of chloracetophenone was dissolved in 140 cc. of chloroform and stirred with 21 Gm. of hexamethylene tetramine until complete solution took place (two hours). After standing over night the addition-reaction was complete; the mass of glistening crystals was filtered off and washed with cold chloroform. Yield 40 Gm. This product was "alcoholyzed" by a mixture of 320 cc. of absolute alcohol and 40 cc. of concentrated hydrochloric acid. After standing 72 hours at room temperature, the precipitated ammonium chloride was filtered off and the alcoholic solution concentrated *in vacuo*. The crude ω-aminoacetophenone hydrochloride which separated

* Section on Practical Pharmacy and Dispensing, Madison meeting, 1933.

was recrystallized from 10 cc. of hot water. Yield 6.75 Gm., melting at 190–192°, with decomposition.

Catalytic Hydrogenation to Phenyl Ethanolamine.—$C_6H_5.CO.CH_2.NH_2.HCl \xrightarrow{H_2} C_6H_5.CHOH.CH_2.NH_2.HCl$.

0.2 Gm. of platinum oxide (prepared by the method of Adams and Shriner, Org. Syn., VIII, 92) was reduced by shaking with hydrogen in aqueous suspension. The platinum black was filtered off and added to the solution of 6.75 Gm. of ω-aminoacetophenone hydrochloride in 225 cc. of redistilled alcohol and 12.5 cc. of conc. HCl. Absorption of hydrogen took place at the rate of 2 cc. per minute. When 970 cc. had been taken up, the reaction was stopped; theoretical for 1 mol., 963 cc. The filtrate from the platinum was evaporated to dryness *in vacuo*. The residue was twice recrystallized from absolute alcohol-ether; yield, 4.31 Gm., melting point 165–168°, with decomposition. The composition of the compound was verified by analysis of its chloroplatinate.

0.2 Gm. of the hydrochloride was dissolved in 2 cc. of absolute alcohol containing 0.25 cc. of HCl, and treated with 3 cc. of 10% aqueous chloroplatinic acid. The orange precipitate was washed with ice-cold alcohol and dried at 105°. Yield 0.29 Gm., melting point 203–204° with decomposition.

Analysis:

Found: Pt.: 28.45%.
Calcd. for $(C_8H_{11}ON)_2.H_2PtCl_6$: 28.53%.

Preparation of the Oleate.—In order to avoid all possibility of decomposition, the free base was prepared by the action of silver oxide and converted, without isolation, to the oleate. 4.0 Gm. of the hydrochloride was dissolved in alcohol and an excess of freshly precipitated silver oxide stirred in until the formation of silver chloride was complete. The filtrate was evaporated *in vacuo* with the theoretical quantity of oleic acid (6.54 Gm.) until free of alcohol.

The neutral oleate thus obtained was dissolved in liquid petrolatum for the physiological tests.

The biological tests on compounds reported herein were made in the Biological Research Laboratories of E. R. Squibb and Sons and we gratefully acknowledge their assistance.

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VARIATIONS IN HAND-MOLDED HYPODERMIC TABLETS.*

BY S. WALLEY BOWER.

During the past year the question of Variations in Hand-Molded Hypodermic Tablets arose, which suggested the following observations:

(*a*) What is the error in the manufacture of these tablets as based on the theoretical?

(*b*) What variations take place when the molding of the same lot of tablets extends over a period of several days?

(*c*) What is the relationship of the percentage error of the total count of the entire lot (as an average) with the error of tablets when weighed in small subdivisions?

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* Section on Practical Pharmacy and Dispensing, A. PH. A., Madison meeting, 1933.

(*d*) What is the difference in error in the molding of one-half grain and one-fourth grain tablets?

Four lots of one-half grain morphine sulphate tablets were selected at random. Each lot was molded by the same operator. This person has been molding tablets for ten years and is experienced in the manufacture. A steel plate containing 200 perforations was used in the making, thus turning out 200 tablets at each operation.

The formula was based on the following: Morphine sulphate, U. S. P. 100 ounces; milk sugar, 16 ounces; making a total weight of 116 ounces, or 50,750 grains. Thus, each 100 tablets was calculated to weigh 58 grains, the mixture theoretically yielding 87,500 one-half grain tablets.

Inasmuch as one-fourth grain tablets are made from a mold the thickness of which differs from that of one-half grain tablets, these two sizes are considered separately.

Four lots of one-fourth grain morphine sulphate tablets were selected. These were based on the following formula: Morphine sulphate, U. S. P., 100 ounces; milk sugar, 88 ounces; total weight, 188 ounces, or 82,250 grains. Each 100 tablets in this instance weighed 47 grains, producing a total theoretically of 175,000 tablets

The molding extended over a period of days, as shown in the following table

TABLE I.—TABLETS MOLDED EACH DAY.

Days.	Lot 1.	Lot 2.	Lot 3.	Lot 4.
		One-Half Grain Tablets.		
1	9,000	27,000	14,000	4,000
2	22,000	32,000	24,000	23,000
3	26,000	29,124	30,000	28,000
4	24,000		20,887	26,000
5	9,802			7,590
Total	90,802	88,124	88,887	88,590
		One-Fourth Grain Tablets.		
1	34,000	18,000	30,000	20,000
2	34,000	30,000	36,000	33,000
3	33,000	34,000	36,000	30,000
4	33,000	34,000	40,000	33,000
5	33,000	34,000	35,308	33,000
6	7,662	25,713		29,008
Total	174,662	175,713	177,308	178,008

TABLE II.—ERROR IN YIELD BASED ON THE THEORETICAL.

Lot.	Yield.	Theoretical.	Over or Under Theoretical.	Per Cen.
		One-Half Grain Tablets.		
1	90,802	87,500	3,302 over	96.40
2	88,124	87,500	624 over	99.49
3	88,887	87,500	1,387 over	98.44
4	88,590	87,500	1,090 over	98.77
		One-Fourth Grain Tablets.		
1	174,662	175,000	338 under	100.19
2	175,713	175,000	713 over	99.59
3	177,308	175,000	2,308 over	98.70
4	178,008	175,000	3,008 over	98.31

In this connection, during several days' work, the human element and physical condition varying in the operator must be taken into consideration. Fatigue might develop late in the day, which would have a tendency to vary the hand pressure in the filling of the molds and slow down the production. Also, the person might work a longer period of time one day than another on this work. This variation may be noted in Table II.

The tablets were allowed to air dry for two days. From each lot manufactured, 5000 tablets were counted and weighed; this being considered as a representative sample. The percentage variation from the theoretical was computed. Also, this percentage variation was compared with the average percentage variation of the entire lot, and the difference noted.

TABLE III.—PERCENTAGE VARIATION OF 5000 TABLETS.

Lot.	Weight of 5000 Tablets in Grains.	Per Cent Variation from Theoretical.	Average Per Cent Variation of Entire Lot.	Per Cent Variation from Average.
		One-Half Grain Tablets.		
1	2768	95.45	96.40	0.95−
2	2855	98.46	99.49	1.03−
3	2846	98.15	98.44	0.29−
4	2809	96.87	98.77	1.90−
		One-Fourth Grain Tablets.		
1	2335	99.39	100.19	0.80−
2	2328	99.10	99.59	0.49−
3	2292	97.55	98.70	1.15−
4	2353	100.15	98.31	1.84+

TABLE IV.—VARIATIONS IN 500 TABLETS FROM THEORETICAL.

	Lot 1.		Lot 2.		Lot 3.		Lot 4.	
	Wt. of 500 Tablets in Grains.	Per Cent.	Wt. of 500 Tablets in Grains.	Per Cent.	Wt. of 500 Tablets in Grains.	Per Cent.	Wt. of 500 Tablets in Grains.	Per Cent.
				One-Half Grain Tablets.				
1	275.6	95.02	283.7	97.84	279.1	96.23	282.6	97.45
2	282.8	97.50*	288.2	99.38	284.7	98.18	274.7	94.72
3	282.5	97.42	291.5	100.54	280.1	96.58	288.8	99.60
4	278.9	96.12	279.8	96.50**	286.7	98.86	283.5	97.75
5	268.2	92.47**	281.3	97.00	280.2	96.61	289.1	99.71*
6	274.9	94.78	294.0	101.38*	286.6	98.85	274.5	94.65
7	274.7	94.74	289.4	99.80	278.6	96.07**	274.6	94.70
8	278.1	95.88	292.0	100.70	293.8	101.33*	284.7	98.17
9	279.9	96.51	291.7	100.57	292.9	101.02	282.7	97.59
10	272.4	93.94	283.5	97.76	284.3	98.02	273.8	94.43**
				One-Fourth Grain Tablets.				
1	228.8	97.35	232.4	98.89	224.4	95.48	229.8	97.77**
2	235.9	100.39	234.3	99.68	228.4	97.19	237.2	100.95
3	236.0	100.40	227.3	96.73**	232.1	98.76	237.5	101.07
4	233.6	99.41	234.6	99.82	230.3	98.00	230.1	97.92
5	236.5	100.64*	234.1	99.60	231.5	98.53	232.2	98.79
6	228.4	97.20**	234.6	99.84	231.2	98.40	232.6	98.97
7	236.3	100.54	228.4	97.20	233.2	99.08*	234.3	99.72
8	233.5	99.36	234.1	99.61	223.1	94.92**	233.9	99.54
9	233.3	99.28	234.2	99.67	227.9	96.98	242.8	103.34
10	233.5	99.36	234.7	99.87*	230.3	98.01	243.1	103.47*

* High. ** Low.

To determine what variations occurred in 5000 tablets, these were divided into lots of 500 tablets. The subdivisions were weighed and the percentage variation calculated from the theoretical.

The theoretical weight of the one-half grain tablets was 290 grains; that of the one-fourth grain, 235 grains.

As it was desired to note the greatest variation that could be found in each lot, the high and the low 500 tablets of each of these was now divided into five parts of 100 tablets each and weighed. From these weighings, the percentage error was computed and tabulated. This was based on the theoretical that 100 tablets of half-grain strength weighed 58 grains and 100 tablets of one-fourth grain strength, 47 grains.

TABLE V.—VARIATIONS IN THE HIGH AND LOW OF 500 TABLETS.

	Lot 1.		Lot 2.		Lot 3.		Lot 4.	
	Wt. of 100 Tablets in Grains.	Per Cent.	Wt. of 100 Tablets in Grains.	Per Cent.	Wt. of 100 Tablets in Grains.	Per Cent.	Wt. of 100 Tablets in Grains.	Per Cent.
	One-Half Grain Tablets.							
High.								
A	56.75	97.84	58.89	101.53*	58.91	101.54*	57.72	99.51
B	57.02	98.31*	58.74	101.27	58.69	101.20	58.40	100.68*
C	56.41	97.26	58.69	101.19	58.66	101.14	57.67	99.43
D	56.37	97.19	58.84	101.45	58.69	101.20	57.21	98.63
E	56.84	98.00	58.67	101.16	58.66	101.14	58.07	100.12
Low.								
A	53.64	92.49	55.83	96.27	55.71	96.05	54.53	94.03**
B	53.60	92.41	55.83	96.27	55.59	95.84**	54.77	94.43
C	53.72	92.62	55.82	96.24	55.70	96.03	54.68	94.27
D	53.55	92.33**	55.63	95.92**	55.73	96.08	55.03	94.88
E	53.66	92.52	56.10	96.72	55.66	95.97	54.83	94.53
	One-Fourth Grain Tablets.							
High.								
A	47.19	100.40	46.93	99.85	46.47	98.86	48.55	103.30
B	47.33	100.70	47.06	100.13*	46.58	99.10*	48.64	103.50
C	47.50	101.06*	46.65	99.49	46.42	98.77	48.70	103.63*
D	47.09	100.17	46.80	99.57	46.39	98.70	48.32	102.80
E	47.06	100.15	46.87	99.72	46.47	98.86	48.61	103.43
Low.								
A	45.73	97.29	45.37	96.53**	44.63	94.96	46.00	97.88
B	45.70	97.22	45.52	96.85	44.53	94.69	45.90	97.65
C	45.90	97.65	45.42	96.63	44.57	94.83	45.90	97.65
D	45.32	96.43**	45.43	96.65	44.47	94.63**	46.05	97.98
E	45.54	96.90	45.37	96.53	44.66	95.02	45.76	97.36**

* High.
** Low.

The figures in the above columns represent the greatest and least deviation from the required standard as found in a representative sample of 5000 tablets taken from each lot. It is quite sufficient that these figures may be considered in basing an average. Consulting the above table, the greatest and least variations of one hundred tablets may be noted. By subtracting the low figure from the high, the

total variation in weight of each separate lot may be determined. This represents the variation which may be expected and caused by the difference of hand pressure in the filling of the molds by the operator.

TABLE VI.—EXTREMES OF VARIATION.

	Lot 1. Wt. of 100 Tablets in Grains.	Lot 1. Per Cent.	Lot 2. Wt. of 100 Tablets in Grains.	Lot 2. Per Cent.	Lot 3. Wt. of 100 Tablets in Grains.	Lot 3. Per Cent.	Lot 4. Wt. of 100 Tablets in Grains.	Lot 4. Per Cent.
				One-Half-Grain Tablets.				
High	57.02	98.31	58.89	101.53	58.91	101.54	58.40	100.68
Low	53.55	92.33	55.63	95.92	55.59	95.84	54.53	94.03
Variation	3.47	5.98	3.26	5.61	3.32	5.70	3.87	6.65
				One-Fourth Grain Tablets.				
High	47.50	101.06	47.06	100.13	46.58	99.10	48.70	103.63
Low	45.32	96.43	45.37	96.53	44.47	94.63	45.76	97.36
Variation	2.18	4.63	1.69	3.60	2.11	4.47	2.94	6.27

The results of the weighings thus place the variations of the tablets within certain limits. These limits may now be assumed to represent the extreme limits of error over or under the theoretical, and within which the tablets of each lot occur. The following table shows this as percentage error.

TABLE VII.—EXTREMES OF VARIATION FROM THEORETICAL.

	Lot 1. Per Cent Error.	Lot 2. Per Cent Error.	Lot 3. Per Cent Error.	Lot 4. Per Cent Error.
	One-Half Grain Tablets.			
High	1.69−	1.53+	1.54+	0.68+
Low	7.67−	4.08−	4.16−	5.97−
	One-Fourth Grain Tablets.			
High	1.06+	0.13+	0.90−	3.63+
Low	3.57−	3.47−	5.37−	2.64−

SUMMARY.

There does not appear to be any fixed ratio between the percentage error of the entire lot of these tablets, taken as a single unit, and the percentage error of the component subdivisions. Several weighings of small quantities of tablets must be made to base an average. However, the percentage error of the entire lot may serve as a guide. Too large a percentage error, that is, too great an over or under yield in the total number of tablets of any single lot, should convey the idea that in the weighing of the subdivisions some of these might be found to be considerably over or under in strength.

The variation is similar in both the one-half grain and the one-fourth grain tablets.

The variations appear to be reasonable, when the nature of the work is considered, and to fall within reasonable tolerances. Therefore, the present tolerances for hypodermic tablets should not be lessened with any new or proposed changes in the law.

ANALYTICAL AND CONTROL LABORATORY,
DIRECT SALES COMPANY, INC.,
BUFFALO, NEW YORK.

HENRIK IBSEN—PHARMACIST.*

BY LOUIS H. RODDIS, COMDR. (M.C.), U. S. NAVY.

Most critics would probably agree that the dramatist next in rank after Shakespeare was the great Norwegian poet, Henrik Ibsen. It is of interest to pharmacists, particularly to those in this section of the United States where there are so many of Norse descent, that Ibsen was apprenticed to a pharmacist in Grimstead, Norway, and spent from his fifteenth to his twenty-first year in a drug store.

Henrik Ibsen was born March 20, 1828, at Skien, Norway. There was some admixture of Danish and German blood in his ancestry. His family belonged to the petty aristocracy of clergymen, sea captains, professional men and small land-

Courtesy of the American-Scandinavian Foundation.

Fig. 1.—The Ibsen Museum—The Apothecary's Shop—Grimstead, Norway.

holders. His father was early impoverished and at the age of fifteen he had to earn his own living. He originally had intended to study medicine but began as an apothecary's assistant in Grimstead where he remained for six years. The building where he worked is now an Ibsen Museum. The shop is not unlike many European shops, with narrow counters, rows of shelves and drawers reaching to the ceiling and filled with labeled bottles. On the prescription desk are scales, mortar and pestle. Many of the prescriptions he copied and filled and notes he made are preserved under a glass case and here are preserved the poet's spectacles and inkwell. The drawer is shown in which he wrote the date 15/4/1850, the day before he left Grimstead for Christiania to prepare for entrance into the medical school of the University.

* Section on Historical Pharmacy, Madison meeting, 1933.

There is a little room in the shop where he lived, so that at night he would be available in case it were necessary to prepare an emergency prescription. Here he did most of the miscellaneous reading and studying that formed the basis of his education for he was unable to carry out his ambition to study medicine or even enter the University. A paper dated September 3, 1850, and found here showed that he failed in his entrance examinations in Greek and mathematics and his general standing was low. While here at Grimstead he made some friendships with young men who exerted some influence over his early career and he also had a love affair with a servant girl, a woman ten years older than himself, by whom he had an illegitimate child. Here, too, he wrote his first play "Cataline."

Fig. 2.—Ibsen Bust, Como Park, St. Paul, Minn.

Although when he left Skien, April 16, 1850, he severed his connection with pharmacy, Ibsen's general interest in medical subjects is shown in a number of his works, notably in two of his dramas, "Brand" and "An Enemy of the People." In the former syphilis forms the central theme; and in the latter a physician, Dr. Stockman, draws attention to the fact that certain natural springs of medicinal waters to which the town owes its fame and prosperity are infected and harmful; as a result, he is declared to be a public enemy by his fellow townsmen and driven from the community.

Ibsen died May 23, 1906, at Christiania known to the whole world as one of the greatest figures in all modern literature.

It must be remembered that two other great literary men, John Keats and O. Henry, were trained in pharmacy and the great name of Dante was inscribed in the list of apothecaries of Florence.

"Detection of murder by poison will be made more sure by a new and accurate method of analyzing human blood to detect and estimate extremely small quantities of alkaloid drugs such as cocaine, strychnine and morphine. The new technique, devised by Dr. Burnham S. Walker and Elizabeth W. Walker, of Evans Memorial and Boston University School of Medicine, will detect six parts of drugs in one hundred thousand parts of blood. It will also be used in gaging the proper dose of these powerful drugs in legitimate medicine."—*Science.*

"Two familiar green aniline dyes are effective in combating and subduing some of the common skin infections that are due to fungi. These dyes, malachite green and brilliant green, were found to be outstanding in killing action, far surpassing all others tested, including aniline violet, fuchsin basic and gentian violet."—Dr. A. McCrea in *Science.*

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

Editor's Note: "The timely subject of Prof. Eby's paper, which follows, is of great interest to all engaged in teaching in colleges of pharmacy. He has covered the visual aids in pharmacognosy, giving information regarding different types and makes of apparatus, in a way that will be helpful to all teachers of the subject. The Editor hopes that similar papers on visual aids in other subjects will be presented at our Teachers' Conference.—C. B. JORDAN, *Editor*."

VISUAL INSTRUCTION IN PHARMACOGNOSY.

BY FRANK H. EBY.*

During the last few years visual instruction has commanded the attention of many educators, and many institutions have made careful studies on this form of instruction and its value as an aid in teaching. Instructors in the field of science have long recognized its value and many consider it one of the most important educational forces at their command. Where careful studies have been made to determine its value, results indicate that there is a definite increase in learning for students who have the advantages of visual instruction as compared to the learning of students having the ordinary forms of class room instruction. Recently a number of educational institutions have established departments of Visual Education which are equipped with all types of projection apparatus and slide and film libraries. In most cases these departments have been established only after careful studies have indicated that visual instruction is a sound educational practice. Improvements in projection devices and the application of new and improved methods in photography have been responsible for much of the progress which we have witnessed in this field.

The importance of visual instruction has been emphasized very definitely during the last few years; however, this form of instruction has been an important part of the educational program in many professional schools for a long time. The many developments which have taken place in this field would seem to justify a brief review of the possible applications of visual instruction in the teaching of Pharmacognosy.

Most teachers of Pharmacognosy are using visual aids but they have been confronted with the problem of preparing or securing suitable material. Very few if any of the organizations which sell or rent visual aids offer satisfactory material for this course and in order to develop good collections of slides and films, instructors have found it necessary to prepare most of the material which they use. In many cases instructors have used their personal photographic and other equipment in preparing material for visual instruction. This condition has been relieved since photographers' supply houses are offering their services for the preparation of slides and films, a service that is very valuable to the instructor who, through lack of time or facilities cannot prepare his own material.

The instructor of Pharmacognosy occupies a position in which there are many

* Temple University.

opportunities for visual instruction. A variety of modern projectors and an almost unlimited field from which to select valuable material make it possible for the instructor with some initiative to develop a varied program which will do much to vitalize the course.

There are five types of projection apparatus available for the teaching of Pharmacognosy: The Lantern Slide Projector, Opaque Projector, Film Strip or Slidefilm Projector, Micro-Projector, and the Motion Picture Projector. Each of these involves different projection principles consequently different material is required for the use of each machine. The interest and initiative of the instructor will determine the character of the program which he may build around any one or several of these devices.

The Lantern Slide Projector is the most widely used and certainly one of the most valuable projectors for use in the class room. Since it is possible to prepare lantern slides on any subject that can be photographed there is practically no limit to its use. An excellent example of the value of the lantern slide as an aid in teaching Microscopic Pharmacognosy has been demonstrated by George H. Needham, of New York, who has prepared a number of photomicrographic lantern slides with the approval of Professor Ballard of Columbia University. Each slide contains from one to four photomicrographs showing typical fields and identifying elements in important powdered drugs. Slides of this type are a very important factor where the instructor wishes to aid the student in the correct identification of microscopic elements or where time does not permit the student to make a thorough study of an important drug in the powdered form. A number of instructors have developed excellent collections of slides showing medical plants, their natural habits and their cultivation. There are, however, very few good collections of lantern slides showing the various phases of Commercial Pharmacognosy, a field which offers a wide variety of subjects on which lantern slides may be prepared. Where the instructor wishes to prepare lantern slides showing drawings, tracings or diagrams, Tracelene, a recently developed product, enables one to prepare quickly and inexpensively lantern slides of good quality. Special glass and solutions used for preparing glass for latern slide drawings or tracings does not give the best results.

The opaque projector permits the showing on a screen, pictures of all kinds of objects approximating flatness. Photographs, pictures from books and periodicals, and drawings can be shown with this projector without any special preparation of the material. The operation is very simple and the results satisfactory.

The Film Strip, Film Slide or Slidefilm Projector is designed for showing pictures printed on standard motion picture films. Two general types of projectors are being used: One, a special machine designed for showing film strips only; the other, a special unit which may be attached to most of the standard lantern slide projectors. In the preparation of film strips such materials as camera pictures, photographs, drawings, half-tones from books or anything that can be photographed may be used. Pictures may be hand-colored and captions may be inserted with each picture. The Society for Visual Education and other producers and distributors of visual aids will prepare film strips from your own material, placing as many as two hundred pictures on a single strip. The advantage in using the film strip is the low cost per picture which permits the instructor to use a

greater variety of pictures or more completely picturize a subject. Where visual instruction is used to a limited extent the film strip does not possess any advantages over the lantern slide.

The Micro-Projector affords a means of direct projection of mounted specimens, a phase of teaching, especially in the laboratory that is of ever-increasing importance. This projector makes it possible for the instructor of Pharmacognosy to point out to large groups many important details in a microscopic specimen, thus assuring more uniform and understandable assignments for student laboratory work. It permits the instructor to differentiate the microscopic characteristics of authentic drugs and common adulterants or substitutes, thus making it possible to demonstrate certain microscopic sections which time would not otherwise permit the student to study.

The Motion Picture Projector is the latest projection device to be used successfully in the class room. In order to derive the full value of good motion picture photography a projector of good quality must be used. Many excellent projectors are available for both the 35-millimeter and 16-millimeter films. Most of the educational pictures which are now being used are supplied in both widths although many instructors prefer the narrow width films because they can be used in the more compact portable projector. Since the introduction of sound motion pictures there have been a number of improvements in projection devices and the disc type unit which was first used in sound motion picture projection has been replaced in many instances by the more satisfactory sound-on-film projector.

Within the last several years we have witnessed the remarkable development of the motion picture as an aid in teaching, and pictures dealing with specific themes have become a part of the teaching program in a number of institutions. There is a wide range of subjects covered in these new films including: Botany, Zoölogy, physics, chemistry, mathematics and music. Their scientific character would seem to indicate that the motion picture can be used in almost any field of instruction. A thorough knowledge of the uses of the many devices of photography including microscopic motion pictures, time-lapse photography, telescopic photography, animated diagrams and sound recording makes it possible to portray the important details of many subjects which cannot be satisfactorily portrayed by any other means.

In considering the motion picture as an aid in teaching Pharmacognosy both silent and sound pictures could be employed and the subjects covered may include: Lectures by outstanding educators, pictures protraying the various procedures employed in the preparation of crude drugs for pharmaceutical commerce, and pictures showing important drug industries such as the Opium, Cinchona and Spice industries and probably many others. A few instructors in Pharmacy Schools have produced some very good motion picture films which they use in their own teaching programs and it is possible that others will produce some excellent films in the future. However, what I have in mind, primarily, is the production of films of outstanding character and scope which cannot be produced by the individual instructor because of the expense and the lack of proper facilities. Films of this type should be produced by skilled technicians under the direction of a capable staff of educators and then be made available for distribution to any School of Pharmacy that may wish to use them. While I am interested in the motion pic-

ture as an aid in teaching Pharmacognosy, I believe there are many opportunities for using this type of visual aid in teaching other subjects in the Pharmacy School Curriculum. The educational films which have been produced by the Erpi Picture Consultants are fine examples of what can be done with scientific material if the latest technical methods are employed and the production of the films is supervised by a capable staff.

At this time I would like to suggest that some consideration be given to the idea of establishing a film library in the new Pharmacy Building at Washington. No provisions have been made for a film library but I have been informed that there is ample space. If worth-while educational films portraying American Pharmacy are to be produced, and I believe they will be eventually, it seems that the Pharmacy Headquarters would be the logical depository and center of distribution for these films. Pharmacognosists would certainly play an important part in the development of a library of this kind and I believe steps should be taken in this direction.

I am convinced that motion pictures can be used to considerable advantage in teaching Pharmacognosy as well as other subjects now being presented in pharmacy schools and I am not unmindful of the difficulties which may be involved in the production of films of outstanding character; however, in any program which we may propose we must understand that the purpose of motion pictures is not to afford entertainment or portray the unusual, but to present subjects which could not be presented with equal effectiveness by any other means.

THE FIRST MODERN PHARMACOPŒIA.*

BY EDWARD KREMERS.

The word Pharmacopœia (1) did not appear until 1561 on the title page of one of the treatises now commonly designated by that name. Moreover, some writers are inclined to recognize as a pharmacopœia any collection of pharmaceutical formulas, be they the *Luminare* of Nicolaus Præpositus (2), the *Formulary* of Scribonius Largus (3), or the directions carved into stone or brick of even more remote antiquity (4). However, most writers on pharmaceutical history prefer to regard as modern pharmacopœias those treatises, originally for the most part merely collections of formulas, that were compiled by special authority and made the pharmaceutical law of the city state which authorized and adopted them (5).

Viewed from this angle it is the Florentine *Receptario* which is generally recognized as the first (5) modern pharmacopœia. As the title page indicates (6) it was compiled by the medical college at the request of the local apothecaries and published in 1498, the year in which Vasco de Gama circumnavigated the Cape of Good Hope, thus discovering the all water route to the (East) Indies. This was six years after Columbus had started on his westward trip hoping to reach the same goal but ending in the discovery of the West Indies. Both discoveries ultimately proved of the greatest importance to the materia medica, hence exerted an indirect influence on the making of pharmacopœias, though this influence did not manifest itself until much later (7).

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* Section on Historical Pharmacy, A. PH. A., Madison meeting, 1933.

As the first modern treatise of its kind, the Florentine book is of unusual interest to the student of the history of pharmacy. Yet the information recorded in the so-called histories of pharmacy is most meager indeed.

Scherer (8) (1822) records the titles of three impressions.

Unfortunately, neither Phillippe (9) (1853) nor Phillippe-Ludwig (10) (1855) contain a subject index. A casual examination of the table of contents and of the chapter on Italian pharmacy, however, failed to reveal a reference to the Florentine treatise.

Frederking (11) (1874) in a chapter entitled "Aerzte und Naturforscher des 15. Jahrhunderts" makes the following remarkable statement: "Ricettario aus Florenz, geb. um 1450, schrieb ein med. Werk in Italienischer Sprache, dessen lateinische Uebersetzung von Guanerius unter dem Tittel Antidotarium 1518 erschien."

Rice (12) (1895) refers to it as "the first formulary or pharmacopœia issued by some public authority."

Guareschi (13) (1897), the commentator on the national Italian Pharmacopœia, makes mention of an edition of1596.

André-Pontier (14) (1900) makes no mention of the book.

Schelenz (15) (1904) at least has something worth while to say, *viz.:*

"Die erste eigentliche Pharmakopöe, von einer Art Pharmakopöekommission bearbeitet und jedenfalls von gesetzlich bindender Kraft, wenn auch vorerst nur fuer den engen Kreis einer Stadt, ist das Ricettario di dottori del arte e di medicina del collegio Fiorentino all instantia delli Signori consoli della universita delli speciali. Firenze 1498.

"Diese Arbeit, die auf Andrängen der Florentiner Universita dei speziali, einer Art Apotheker-Gilde, von einer jedenfalls ad hoc von dem dortigen Ärzte-kolleg zusammenberufenen Kommission in Angriff genommen wurde, war grundlegend nicht nur fuer eine zweite Auflage von 1550, sondern auch fuer das Antidotar von Antwerpen von 1561 und das Kölner Dispensator von 1565, und sicherlich hat Cordus sie auch fuer seine erste deutsche Pharmakopöe von Nürnberg eingesehen und benutzt.

"Ohne Zweifel ist die Bearbeitung des eben erwähnten Arzneibuches auf die Unannehmlichkeiten zurückzuführen, welche die Verschiedenheit der Arzneivorschriften in den mannigfaltigen von den Apothekern benutzten Kompendien, Antidotarien u. dgl. besonders in einer Stadt mit jedenfalls grossem Fremdenverkehr (wie in Florenz) nach sich ziehen musste."

The above quotation is taken from his chapter on "Mittelalterliche Arzneikunde." From the next chapter covering the 16th century, we quote the following paragraph:

"1550 kam in Florenz das zweite, wieder vom Collegio de' medici bearbeitete Ricettario heraus, dessen Inhalt eingeordnet war in: Semplici, Ricette, Misure und Succedanei. Es gedenkt der Verfälschungen der ersteren. Das Ricettario liegt der Antwerpener und Kölner Pharmakopöe zu Grunde" (16).

Tschirch (17) (1904) records the title of the first edition, also the dates of later impressions or editions, which we are not advised.

In his chapter on "Pharmacopœias," Wootton (18), informs us that "The College of Medicine of Florence adopted an Antidotarium in the early part of that century (16th) and . . . ."

Danckwortt (19) (1913) makes the following statement:

"Als erste Pharmakopœ in diesem Sinne ist ein Werk anzusehen, das im Jahre 1498 in Florenz erschien unter dem Titel Ricettario di dottori del arte e di medicina del collegio Fiorentino

all' instantia delli Signori consoli della universita dei speziali. Die Florentiner universita dei speciali war eine Art Apothekerverein, auf dessen Wunsch das Arzneibuch von einer Aerztekommission herausgegeben wurde."

From Bruntz and Jaloux (20) (1918) the following statement may be quoted:

"En 1498, le Collége des médecins de Florence public l'Antidotaire florentin, sous le titre: *Ricetario di dottori dell'arte e di medicina del Collegio Fiorentino alla instantia delli Signori Consoli della universita speciali Firenze.* Cet ouvrage est, a juste raison, considéré comme une des premières Pharmacopées officielles. Il fut réédité d'abord en 1567 et souvent dans la suite: 1571, 1574, 1597, 1623, 1670, 1696, 1789."

LaWall (21) (1926) reproduces the title page of the 1696 edition which he enumerates in his Chapter "The Golden Seventeenth."

It is certainly worth while to quote these statements in full if for no other reason than to impress the student of our past with the painful meagerness of the information recorded. Even the bibliographic data cataloged are extremely fragmentary and no attempt appears to have been made to discriminate between revisions and reprints. Of a general pharmaceutical background, not to mention the equally important political, economic and social background, not a word, except possibly the most casual remark by Schelenz. Certainly, the book that is pronounced the first official pharmacopœia, in other words, the first representative of that type of literature to which we like to refer as being the bible of the pharmacist, deserves more careful study and a more generous treatment.

Having seen how little appears to have been known about this treatise to our pharmaceutical historians, let us now proceed to ascertain what may be learned about the book from other sources.

First of all, let us try to find an answer to the question why Florence should have been the first city state to produce such a guide for its apothecaries.

Strange as it may seem, it was neither Venice nor Genoa, the two principal seaports which played so important a rôle in the commerce of oriental drugs and spices, that was the first to have a pharmacopœial standard officially adopted and in force. Neither did Naples nor Messina, the two other seaports of importance attain to this distinction. It was Florence, the inland commercial metropolis of the north central part of the Appennine peninsula that took the first step in this direction. Moreover, a study of the pharmacopœial map of Italy reveals that it was in the Lombardy plain and surrounding territory that city-state pharmacopœias flourished, presumably for the simple reason that here agriculture, industry and commerce enjoyed a greater development than in the more mountainous portions of the peninsula. The seaports enjoyed the possible advantage of the Levant commerce, but they presumably did not have the hinterland to develop either agriculture or industry. Moreover, Florence, while not in the Lombardy plain itself, was on the main highways across the Alps. Pilgrims to Rome, crusaders going and returning, armies of the German emperors passed through this flourishing city. It may have been, in part at least, this international aspect of Florence, which, as Schelenz points out (22), contributed to the desirability of a standard to be adopted by all apothecaries.

As already stated, a mere glance at the map of the city-state pharmacopœias of Italy reveals that the principal pharmacopœial development took place in the flourishing Lombardy plain. A somewhat more careful scrutiny of this same map reveals the mighty Po and its northern tributaries, also the Etch (Adige), the Brenta and the Piave with their sources in the Alps. The valleys of these rivers naturally constituted as many routes. Lakes Como and Garda afforded additional waterways farther to the north. Beyond the water shed, the Rhone, the Rhine and the Danube have their origin, and their valleys and those of their tributaries constituted as many routes into the transalpine countries. Mention need only be made of the St. Gotthard pass, the Engadin

and the Brenner pass to indicate the commercial, not to say anything about the military, importance of the topography to the north of Florence and to acquire a glimpse of the strategic significance of this city of the Medici.

Having pointed out how the geographical position of Florence aided its economic development that caused the humanities and the arts to flourish, a brief review of its history cannot be out of place.

"It would seem that as early as the time of Sulla there was a Roman colony on the site now occupied by Florence; another was established after the death of Julius Caesar, and it soon became a thriving town. But it was not till the time of Charlemagne that Florence began to rise out of obscurity. In the 11th century Florence and a great part of Tuscany were bequeathed to Pope Gregory VII by the Countess Matilda. Under the protection of Rome, Florence speedily adopted the forms and institutions of a free city. As early as the 11th century the Florentines were European traders and the possessors of commercial depots in the seaports and cities of France and England, and their skill as workers in gold and jewels had grown famous. The 'arti' or trade gilds were of great importance. During the bitter wars between pope and emperor which raged throughout Italy, Florence and all Tuscany seemed to have been saved from the feuds of Guelphs and Ghibellines—the former adherents of the papacy, the latter of the empire. But in 1215 Florence became involved in the great party struggle."

This struggle, supported by the French, lasted for two centuries and more. At one time during this period the plague or black death, demanded 100,000 victims, *viz.*, in 1348. In 1406 Pisa, an ancient and illustrious republic, fell under the sway of Florence, becoming, as it were, its seaport near the mouth of the Arno, in the beautiful valley of which Florence itself is located. From 1434 the history of Florence is intimately bound up with that of the House of the Medici. After various ups and downs Pope Clement VII of the House of Medici, formed a league with the Emperor Charles V which resulted in the capture of Florence in 1530. From this period on Florence loses her distinctive history, and is only known as the capital of the grand duchy of Tuscany (23).

As already pointed out, this meager skeleton of a general background, receives no pharmaceutical flesh and blood from the histories of our calling. When, therefore, Luca Landucci's diary, covering the period of 1450 to 1516, was translated into English (24), it was hoped that this record of a Florentine apothecary might throw light on the history of the first modern pharmacopœia. But while the author records faithfully the doings of the piazza on which his shop was located, not a word about the official guide. True, he makes mention of the revival of the apothecaries' guild, but only to inform us that its members met to discuss the price regulation of candles, but not that the guild requested the medical faculty to compile a pharmacopœia for their guidance (25).

Once more, therefore, we are thrown upon the pharmacopœia itself for such internal evidence of its inception and evolution as we may glean from the title pages of its several editions or from the introductory prefaces.

. . .

P.S. After this paper had been written, there came to the writer's attention a lengthy article on early Italian pharmacopœias published in an Italian medical journal as far back as 1887. Both language and place of publication may be responsible for the fact that none of the authors mentioned were aware of such an article. Although this discovery will give new direction to further work on the subject, the facts recorded in this account remain unchanged.

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(25) For an account of the author and his diary so far as pharmaceutical matters are concerned, see the paper read at the Portland meeting of the A. PH. A. in 1929.

A STUDY OF THE HYDROGEN-ION CONCENTRATION OF TINCTURE OF DIGITALIS, TINCTURE OF ACONITE AND FLUIDEXTRACT OF ERGOT.*

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Introduction.—This investigation was undertaken for the Revision Committee of the U. S. P. A monograph on hydrogen-ion concentration has been tentatively accepted for admission to the U. S. P. XI. Thus, the hydrogen-ion concentration of official preparations will be stated where it is deemed desirable. The determination of this constant must, however, yield information pertinent to the therapeutic efficacy or stability of the product. The test outlined must be simple and yet reasonably accurate. The colorimetric method meets these fundamental requirements and is accepted.

The preparations that have been studied are: Tincture of Digitalis, Tincture

* Section on Practical Pharmacy and Dispensing, Madison meeting, 1933.

of Aconite and Fluidextract of Ergot. The literature concerning the hydrogen-ion concentration of these preparations has been reviewed. Representative samples of the preparations as purchased and as experimentally prepared have been studied. As a result of these reviews and studies certain conclusions have been drawn and recommendations made.

EXPERIMENTAL.

Tincture of Digitalis.—The physicochemical work on the hydrogen-ion concentration of extractive preparations of digitalis began about a decade ago. Takahashi (1) showed that the addition of 0.05 per cent to 0.1 per cent of hydrochloric acid to the infusion of digitalis increased the stability as shown by the frog method. Tainter (2) showed the physiological activity of freshly prepared infusions of digitalis is independent of the hydrogen-ion concentration. He showed that the infusion may develop acid or alkaline reaction upon standing, depending upon the nature of the decomposition. The hydrogen-ion concentration of the tincture was found by Tainter to be the equivalent of $N/10{,}000$ hydrochloric acid, approximately p_H 4.6. Smith (3) in his studies on the determination of the hydrogen-ion concentration in alcoholic solutions investigated tincture of digitalis and found the range of p_H to be between 5.12 and 5.77. Of special interest is the work of Joachimaglu and Bose (4) who showed the stability of tincture of digitalis to be increased by the addition of 0.1 or 0.2 per cent of tartaric acid. These investigators found the p_H of tincture of digitalis to be 5.88, with 0.1 per cent tartaric acid the p_H was 5.44 and with 0.2 per cent 5.13. The stability of the heart-tonic value of the tincture was not markedly different when tartaric acid was added. In 1921, Joachimaglu (5) had observed that the addition of sodium bicarbonate to ticture of digitalis materially increased the speed of deterioration.

In 1930 Krantz (6) studied the buffer capacity of tincture of digitalis. In this study the p_H of seven samples of digitalis are reported.

No.	p_H.
1	5.88
2	5.67
3	5.70
4	5.67
5	5.68
6	5.73
7	5.61

The change in p_H upon aging of the tincture, when stored in indirect light is reported.

p_H When Prepared.	p_H After One Year.	p_H After Two Years.
5.88	5.66	5.38

In the same year, Krantz and Carr (7) studied the change of p_H of tincture of digitalis when stored in various colored glass in direct light.

	p_H.			
When Prepared.	Flint Glass.	Blue Glass.	Amber Glass.	Irradiated.
	5.59	5.59	5.59	5.59
42 days	5.09	5.18	5.20	5.19
70 days	4.89	4.87	4.98	....

In 1931 Krantz (8) studied the hydrogen-ion concentration of infusion of digitalis and reported the following p_H measurements.

No.	p_H Infusion.	p_H Tincture.
1	5.81	5.90
2	5.96	6.20
3	4.97	6.02
4	5.86	5.90

In 1931 Haag and Jarrett (9) found no constant relationship between the hydrogen-ion concentration and the heart tonic value of the tincture. The tinctures studied had a hydrogen-ion concentration generally below p_H 4.50.

Krantz and Munch (10, 11) in 1932 studied the influence of the alcoholic content of the menstruum upon the p_H of the tincture. They report an average p_H of four tinctures U. S. P. 5.75. The tinctures from the same drugs made with dehydrated alcohol showed an average p_H of 4.00. This vast increase in acidity is accompanied by a drop in heart-tonic value. However, the authors indicate that the diminution in potency is in all probability caused by the inefficiency of dehydrated alcohol in the extraction of the glucosides.

Scoville (12) in his recent studies has buffered the tincture with sodium acetate and reports increased stability.

Studies conducted by Munch (13), as chairman of the committee on bioassays of the AMERICAN PHARMACEUTICAL ASSOCIATION, seem to indicate that the rate of deterioration of the tincture is slow. Therapeutically, the stability scarcely changes in two years.

CONCLUSIONS.

From these data the following conclusions are drawn:

1. Tincture of digitalis made by the official process will have a p_H between 5.50 and 6.00.
2. This tincture (considering the manner of its dosage) is a stable product.
3. There is no unequivocal evidence to show that by buffering or adding acid to the product its stability can be increased.
4. It has been suggested, therefore, that no p_H range for tincture of digitalis be stated in the forthcoming Pharmacopœia.

Tincture of Aconite.—In 1924 Swanson (14) published some studies on the stability of the tincture and fluidextract of aconite. In this work the literature is quoted, indicating the stability of the alkaloid in acid solution. Swanson concluded that, "The rapid deterioration of tincture of aconite can be prevented by the addition of an acid to the finished percolate or menstruum." Further, "That the deterioration of the tinctures and fluidextracts is probably due to the decomposition or hydrolysis of the alkaloids, and may be a hydrogen-ion concentration factor."

In a previous communication Swanson (15) had recommended adding 2 per cent acetic acid or 0.1 per cent hydrochloric acid to the menstruum as a stabilizer for tincture of aconite.

In a subsequent communication Swanson and Hargreaves (16) showed a definite relationship between the stability and p_H of tincture and fluidextract of aconite. Without acid the p_H of tincture of aconite is 5.13. The stable p_H range lies between 2.5 and 3.0. The authors state, "The amount of acid required to produce the desired p_H depends upon the amount of alkaloids and inert material present in each lot of drug." About 0.03 cc. HCl per 100 cc. produces approximately this p_H. This is approximately 2.9 cc. of diluted hydrochloric acid per liter.

EXPERIMENTAL.

A sample of tincture of aconite was prepared by the official process. The drug was a composite sample of three commercial specimens of aconite. The p_H of the tincture was determined by the Wilson (17) type hydrogen electrode. The tincture was diluted fivefold with a mixture of 3 parts of alcohol and one part of water. At this concentration the tincture retains only a pale yellow color.

p_H Tincture.	p_H Dilution.
5.56	5.90

Twenty-five cc. portions of the tincture were treated with varying quantities of diluted hydrochloric acid. The p_H of these was determined and also the p_H of the fivefold dilution by means of the hydrogen electrode. These results are shown in the following table.

No.	Cc. Dil. HCl.	p_H Tincture.	p_H Dilution.
0	0	5.56	5.90
1	0.15	3.65	3.85
2	0.30	2.32	2.61
3	0.45	1.95	2.42
4	0.60	1.72	2.22
5	0.75	1.58	2.06
6	0.90	1.46	1.96
7	1.05	1.38	1.85
8	1.20	1.32	1.71

These results are plotted in Fig. 1, expressing the acid in moles.

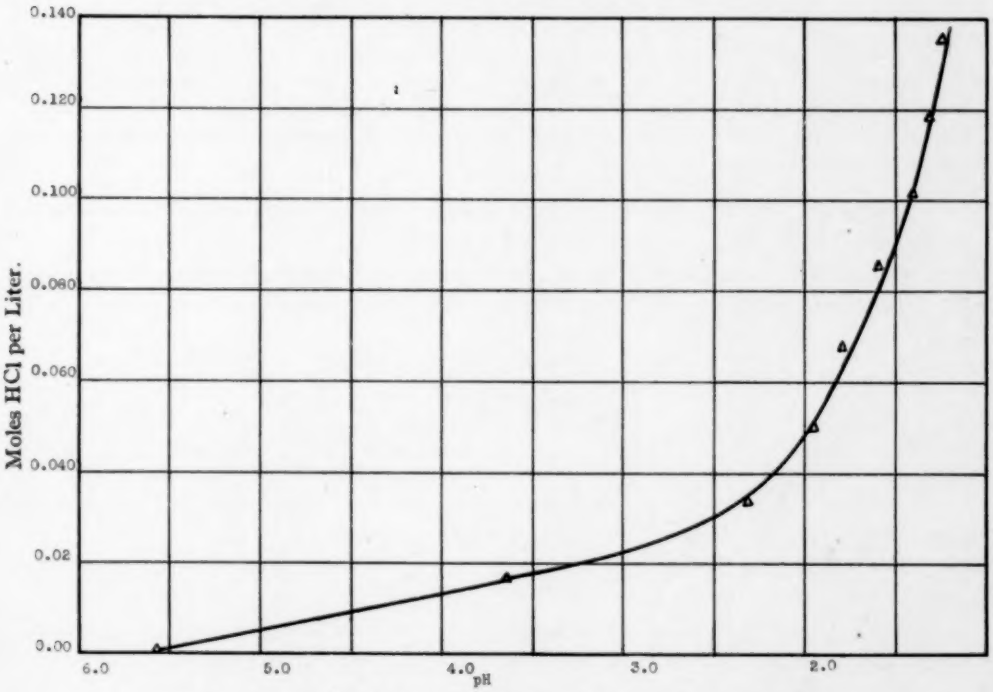

Fig. 1.—Influence of strongly dissociated acid on tincture of aconite.

The curve is a straight line between p_H 5.56 and 3.00. To change the p_H of this composite tincture 2.56 p_H units, 0.022 mole of HCl per liter was added to the buffer capacity of the tincture using the Van Slyke (18) ratio $\frac{-dB}{-dp_H} = \frac{-0.022}{-2.56} = 0.0086$. It is indeed of interest to note that the value obtained by Krantz (19) for tincture of digitalis was 0.0090.

For practical purposes, the indicator solutions thymol blue and methyl orange were selected. The p_H range of the former is 1.2 (red) to 2.6 (yellow); at p_H 2.2 an orange color is exhibited. With methyl orange the range is p_H 3.1 to 4.4. Thus, a solution acid to methyl orange (p_H 3.1) and showing an orange color with thymol blue will be between p_H 2.2 and 3.1, *i. e.*, the stable range suggested by Swanson.

The preparations in the foregoing table reacted to these indicators as follows:

No.	Thymol Blue.	Methyl Orange.
0	Yellow	Yellow
1	Yellow	Yellow
2	Orange	Red

No.	Thymol Blue.	Methyl Orange.
3	Red	Red
4	Red	Red
5	Red	Red
6	Red	Red
7	Red	Red
8	Red	Red

Thus, sample No. 2 meets the requirements and the p_H of this tincture is 2.32 electrometrically.

Accordingly the following statement is suggested for the Pharmacopœia under the tincture of aconite monograph.

"Add to the finished percolate diluted hydrochloric acid in 0.5 cc. volumes until 1 cc. of the tincture diluted to 5 cc. with a mixture of 3 volumes of alcohol and one volume of distilled water shows a red color, when 6 drops of methyl orange T.S. are added, but no deeper than an orange color, when 5 drops of thymol blue T.S. are added to another similar dilution of the tincture (p_H 2.0 to 3.0)."

Swanson's stability curve for the tincture shows a long, flattened portion of maximum stability which is well included within this p_H range.

As a matter of general interest, five commercial samples were purchased and the p_H determined as described previously. These values are shown in the following table.

A. p_H 3.48
B. p_H 3.05
C. p_H 4.03
D. p_H 2.75

Only sample "D" met the requirements of the test suggested, although each label stated that the hydrochloric acid had been added.

CONCLUSIONS.

1. A method has been described for determining the p_H of tincture of aconite which provides for variations in commercial samples of crude drug.
2. A colorimetric method of controlling the p_H of the tincture has been described.
3. The buffer capacity of the tincture has been determined.
4. The Van Slyke ratio was observed to closely approach the ratio for tincture of digitalis.
5. Samples of commercial tinctures showed a wide deviation from the suggested optimum p_H, which suggests the need for standardization.

Fluidextract of Ergot.—There seems to be no controversy regarding the favorable influence of acids upon the stability of fluidextract of ergot. The acetic acid employed in the menstruum of the U. S. P. VIII was changed to the more strongly ionized hydrochloric acid in the U. S. P. IX and this formula was in turn adopted by the revision committee of the 1920–1930 decade. During the last half decade, the interest in fluidextract of ergot, which had reached a condition of somnolent passivity, was revived and deepened by a variety of activities. The ergot investigation of 1929 instituted by a senatorial committee, the appearance of ergotamine tartrate on the market, the indictment and restoration to grace of the cock's comb assay and the influence of hydrogen-ion concentration upon the stability of extractive preparations of ergot have served to bring this drug an unusual degree of legal and pharmaceutical prominence. The results of the studies of

hydrogen-ion concentration on the stability of the fluidextract are, however, the chief concern of this report.

In 1929 Swanson (20) studied the standardization and stabilization of ergot preparations in relationship to the hydrogen-ion concentration factor. In this work he showed that the fluidextract of ergot requires a certain amount of acid to prevent deterioration. The graph set forth in Swanson's report shows that in the study of the fluidextract over a period of two years, a p_H of 3.00 or less is necessary to prevent deterioration. The importance of this, gleaned from the work of this investigator, cannot be overestimated, for at p_H 5.35, the fluidextract lost 90 per cent of its activity over a period of two years, whereas, those fluidextracts having a p_H less than 3.00 retained more than 90 per cent of their original activity over this same period.

In 1930 Thompson (21), in a comprehensive study of ergot and its extractive preparations, makes the following comment regarding the addition of acid:

"The hydrochloric acid of the prescribed menstruum plays a double rôle. *First*, it increases the efficiency of the menstruum in extracting the specific alkaloids, and *second*, it increases the stability of the product. Proper control of this acidity is therefore of vital importance. The use of organic acids, such as citric or tartaric, in place of hydrochloric, serves no good purpose, in that such departure from the U. S. P. method decreases the efficiency of the menstruum in extracting the alkaloids and also detracts from the stability of the finished product."

In a subsequent communication Thompson (22) studied the stability of various samples of fluidextract of ergot in relation to the hydrogen-ion concentration of the preparation. Thompson lists the following data.

No.	Present Age Approx.	Per Cent Deterioration in 18 Months.	p_H.
1	5 years	10.6	4.192
2	3 years	5.7	1.778
3	18 months	8.4	1.809

In this work Thompson calls attention to the fact that the fluidextract with the highest p_H showed the greatest degree of deterioration.

Rowe and Scoville (23), in 1931, made a study of the stability of fluidextract of ergot, using, respectively, hydrochloric acid and hypophosphorous acid as stabilizing agents. Most of the preparations studied by these workers deteriorated rather rapidly and because in most instances the p_H was practically the same, no conclusions can be drawn from this work regarding the influence of p_H on the stability of the fluidextract.

In 1932 Swanson (24) studied the stability of ergotamine tartrate crystals in hydroalcoholic solution in the presence of phosphate buffers. These workers conclude that a solution of pure ergotamine tartrate crystals in 40 per cent alcohol with a hydrogen-ion concentration of around p_H 3.00 appears to be the critical point, where there is the least deterioration.

Wokes and Elphick (25) observed that the efficiency of extraction of ergot with a 50 per cent neutral alcohol depended upon the acidity of the crude drug. With more acid specimens of ergot (p_H below 5.5) the neutral menstruum was quite as effective as one to which either hydrochloric acid or tartaric acid had been added. These workers suggest, that owing to the presence of certain phosphate buffers in the drug, the amount of acid required for each sample of ergot cannot be definitely established. Therefore, a control of the finished product by p_H adjustment seems to be advisable.

Swanson (26) reported in 1932 that over a period of three years, there was a distinct deterioration in eight samples of fluidextract of ergot studied. However, the samples with a p_H around 3.00 showed the least deterioration. In the conclusion of this paper, Swanson, *et al.*, set forth the following comment: "The data in this report show no definite conclusions that the deterioration of fluidextracts of ergot or a solution of pure ergotamine tartrate is prevented by definite hydrogen-ion concentration."

In a subsequent investigation from Swanson's laboratory, Powell (27) reported on a series of eighteen fluidextracts. These products were stored six months, at room temperature, and subsequently assayed by the Broom and Clark method and also by Smith's chemical method. The results of the two methods of assay show a remarkable agreement. Again, this worker observed that those fluidextracts, the p_H of which was close to 3, retained the greatest degree of original

potency. At the close of the account of this investigation Powell made the following statements. "Some fluidextracts of ergot deteriorate rapidly regardless of hydrogen-ion concentration," and also "The hydrogen-ion concentration still appears to have some influence on the stability of fluidextracts of ergot."

Smith and Stohlman (28) conclude from a series of extensive investigations that a variation of p_H from 5.2 to 2.2 does not favor the stability of fluidextract of ergot.

Swoap, *et al.* (29), reviewed the work of previous investigators in the field and in conjunction with studies which they conducted concluded that the manipulation of the p_H of the fluidextract did not favorably influence the stability of the product. Contrary, in a measure at least, to the findings of Swanson and his associates, Swoap states that, "p_H variations between the limits of 3.0 and 6.1 do not enhance the stability of fluidextract of ergot," furthermore, "manipulation of p_H in the finished fluidextract appears to be more harmful than beneficial."

CONCLUSIONS.

In summarizing the foregoing opinions of the authorities in the field of the pharmacy and pharmacology of ergot, one is convinced that there exists absolutely no unanimity of opinion regarding the effects of the manipulation of the p_H. The fluidextracts prepared by the official process containing 20 cc. of hydrochloric acid per liter show a p_H of approximately 4.5. Apparently this value is subject to a considerable degree of variation. However, as the evidence which is available to show that changing this value to p_H 3 is in no sense convincing, it seems contrary to the policy of the Pharmacopœia to establish such a requirement.

Unless, therefore, prior to the publication of the forthcoming revision of the Pharmacopœia, there is unequivocal evidence produced to show that the manipulation of the p_H is an important factor in controlling the stability, the authors recommend that the acidity of the menstruum and percolate remain unchanged.

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JOINT SESSION OF THE SECTION ON EDUCATION AND LEGISLATION, A. PH. A., CONFERENCE OF PHARMACEUTICAL LAW ENFORCEMENT OFFICIALS AND CONFERENCE OF PHARMACEUTICAL ASSOCIATION SECRETARIES.

ABSTRACT OF THE MINUTES HELD IN MADISON, WIS., AUGUST 31, 1933.

The meeting of the Section on Education and Legislation, Conference of Pharmaceutical Law Enforcement Officials, and Conference of Pharmaceutical Association Secretaries, convened August 31st, at 8:00 P.M. The meeting was called to order by Chairman R. L. Rivard, who suggested that reports on enacted and proposed legislation affecting pharmacy in various states be taken up. This idea was carried out.

Alabama.—W. E. Bingham stated that at the Toronto meeting he had made a report on legislative happenings and there had been no regular meeting of the Alabama Legislature since that time. He said further that three years ago the Department of Agriculture had charge of the state inspectors and paid all expenses and salaries, but when the depression came on these expenses were thrown back on the Board of Pharmacy. Two special sessions of the Legislature were held; the first, to create an income tax and place a special sales tax on drug stores; the sales tax was defeated but the income tax was passed. The latter was submitted to the people and it was killed by them. Another special session considered an income tax and a joint sales tax which applied to everybody. Through combined efforts of the druggists and others the bill was defeated; later, an income tax was passed.

Colorado.—Charles J. Clayton reported for Colorado, in part as follows: There was no legislation during the regular session of the Colorado Legislature and everything espoused by the drug trade organizations was successful; no sales tax was imposed. A "Junior Capper-Kelly" bill became a law; this was introduced by the Retail Merchants Association of Colorado, the membership of which is chiefly made up of grocers; success of the "Anti-Discrimination" bill was due to the same activities. Colorado druggists espoused and secured the passage of a bill forbidding the use of "Drug Store" or "Pharmacy" signs at or on places which are not licensed pharmacies by the Board of Pharmacy. A bill was passed under which others than pharmacists may sell certain specified drugs in original packages, in places located more than five miles from a licensed pharmacy—a license fee of five dollars per year is imposed for this privilege. A new alcohol law was passed, which liberalizes the conditions under which alcohol may be sold at wholesale, but forbids its sale at retail, except as a component part of some manufactured article which is unfit for beverage use.

The sale of beer in bottles, not to be consumed on the premises, was authorized at the regular session, and at a special session, held in August, this was amended to permit the sale of beer on draught, in any place that is willing to pay the license fee.

Georgia.—Robert C. Wilson reported for Georgia as follows:

A prerequisite law was passed which will require graduation from a generally recognized School of Pharmacy plus one year of drug store experience.

In the reorganization of the State Board of Health two pharmacists and two dentists along with physicians now compose the Georgia State Board of Health.

The "Uniform Narcotic Law" passed the Senate but was not acted upon in the House, largely due to the fact that physician members of the House blocked it until too late in the session to have it put on the calendar.

A bill was introduced prohibiting the sale of barbituric acid compounds or derivatives and other hypnotics except on physicians' prescriptions, but this failed of passage.

An additional ten per cent tax on cigars and cigarettes to an original ten per cent was defeated.

A tax of twenty-five cents per gallon on soda water syrup was defeated.

Maryland.—Robert L. Swain, reporting for Maryland, said that the Legislature had a very hectic session. A matter of early prominence was the financial status. A general sales tax was proposed which later was dropped and a commodity tax was discussed; finally, there was no sales tax passed and there was also a substantial decrease in state taxes. He referred to conditions in Maryland in saying that its bonds were sold at the highest price of any state bonds in recent

years. A chain store tax, modeled on that of Indiana, was passed; a maximum of $150 is imposed when a chain reaches a total number of twenty stores. There was considerable opposition but, finally, it was passed almost unanimously in the House, only five votes against it, and the Senate passed the bill unanimously.

The Uniform Narcotic bill was presented. The speaker gave an historical account of this model. He referred to a meeting with the Committee in charge of the measure, at which time it was pointed out that the proposed measure was unsatisfactory. However, it was approved by the American Bar Association and the bill submitted in due course in about forty states. As soon as it was introduced in Maryland a conference was arranged, at which time it was emphasized that certain specific amendments were necessary before the bill would be acceptable to the drug group. It became evident that an effort was being made on the part of the Federal Commissioner of Narcotics to have the bill passed in Maryland as a proving ground. At the hearing on the bill the Federal Commissioner of Narcotics and his legal staff were present; the Maryland organizations voiced their objections; the members of the Medical Society voiced their protest and also the American Dental Society and the State Board of Health of Maryland. The hearing evidenced that the bill was hopelessly defective and the net results would be a great burden on druggists and others who were charged with prescribing and dispensing of narcotics The bill was finally defeated; only nine states out of the forty in which it was introduced passed the measure. The speaker stated that the Federal Narcotic Commissioner is still working on the bill with the hope of making it more acceptable.

It was provided by the Maryland Legislature that druggists cannot sell beer in any form. A separate bill was enacted for the city of Baltimore, and another for the other part of the state. The Solicitor for the city of Baltimore had requested an interview with Dr. Swain, who informed the solicitor it would be a mistake to have drug stores handle beer; the latter was pleased with the stand taken by Dr. Swain. During the course of discussion in the Legislature the members of the drug group voiced their opposition to the sale of beer in drug stores, and the Governor accepted of provisions recommended by them.

During the year the Attorney General ruled that automatic vending machines could not be used for vending drugs. A copy of this opinion was sent to the secretary of the Conference of the Law Enforcement Officials and to the secretaries of the various State associations. Quite a number of states passed similar laws, prohibiting the vending of drugs by means of automatic vending machines.

Massachusetts.—Carl G. A. Harring stated that a Massachusetts bill prevented stores other than registered drug stores from displaying signs which indicated that they were registered drug stores, if they were not. It was defeated in the Senate. A bill was introduced which provided that insulin was to be given to every one who wanted it; this bill was defeated by the Board of Health. Another bill proposed a beverage tax by which it would have become necessary to keep account of all sales and tax paid. The bill was defeated. The "Uniform Narcotic" bill was introduced; it was defeated.

Michigan.—M. N. Henry reported for Michigan. He stated that much legislation was proposed by druggists but little enacted. A bill was introduced prohibiting the sale of drugs in other than drug stores; after considerable discussion the bill was defeated. It is contemplated to bring the bill back into the Legislature this year. A bill was proposed to cut out the *per diem* of members of the various Boards in Michigan. A "Paregoric" bill was introduced and this also was killed.

A chain store tax for a chain of over three stores was passed, but vetoed by the Governor and passed over his veto. A sales tax was passed and this is a great nuisance. The average druggist is only able to collect about one-half the tax. Another bill was the Trades Practice Bill which provided that a chain must have uniform prices all over the state for each article; this was defeated.

Pennsylvania.—C. Leonard O'Connell stated that they had some trouble with the Revenue Department in having prescriptions exempted from the Mercantile Tax. This required that the Mercantile Tax Law had to be amended and while there was some difficulty it finally was amended and signed by the Governor.

M. N. Henry, speaking for Michigan, stated that a bill was passed which provides that "Assistant Registered Pharmacists" after five years may become full "Registered Pharmacists."

Robert L. Swain referred to the Pennsylvania matter spoken of by C. Leonard O'Connell. He said that this was probably due to the terminology. It is much better to speak of prescription practice than prescription business.

Indiana.—F. V. McCullough stated that a tax of one-fourth of one per cent had been placed on gross receipts.

West Virginia.—J. Lester Hayman stated that the druggists had been very successful and had received, practically everything asked for. The Governor called a special session of the Legislature for raising revenue. After a 5-weeks' fight the session ended without revenue enactment. A bill was prepared prohibiting sales of drugs by vending machines, which was passed. A compromise on a sales tax resulted in a tax of three-fourths of one per cent. A bill providing for registered drug stores was passed after considerable effort. A chain store tax, maximum of $250 for each store over seventy-five and $2 for an individual, was passed. A bill providing for a 50 cent tax on whiskey and an annual tax of $10 for the sale of medicinal wines was passed.

Texas.—Walter D. Adams stated that there was not much to report from Texas. There was a slight change in the State Narcotic Law sponsored by the State Medical Association.

There was trouble, because the Attorney General declared that part of the law by which the State Pharmacy Board collected the state registration money and turned it over to the State Association was unconstitutional. Attorneys were employed and, finally, they were convinced that if it was not turned over to the State Association it should be returned to the individuals. The Attorney General, later, ruled that the law was constitutional. About $9000 was involved; a test case was made and the druggists won out.

Indiana.—F. V. McCullough stated that the Indiana Legislature continued in session for about 100 days during the past year. The "Uniform Narcotic Bill" was introduced, but it was finally killed in the Senate. It was reintroduced and the bill was turned over to an attorney of the Medical Association and Mr. McCullough was asked to assist in rewriting the bill. The objectionable features were cut out and the bill passed in that way. A poison bill brought about considerable publicity on account of a poison case in Indiana at that time. The bill passed the House but was killed in the Senate.

A bill permitting the sale of beer in drug stores is in effect and in some stores it is being sold; in his opinion, it would have a demoralizing effect on the drug business. An attempt will be made at the next session of the Legislature to prohibit the sale of beer in drug stores. A license tax has been imposed for the sale of whisky and a tax of 25¢ a pint. A chain store tax bill was passed requiring a payment of $3 for individuals and $5 for chains.

South Dakota.—Rowland Jones reported that the grocers endeavored to have more privileges in selling drugs and had a bill introduced permitting the sale of patent and proprietary medicines as well as household remedies. After considerable discussion, household remedies were eliminated and the license fee was rasied to $3 for the sale of patent and proprietary medicines. Wholesale houses encouraged a number of venders selling patent medicines, but as the grocers could not sell these most of the goods were returned. A gross income tax was passed and one-half of one per cent for manufacturers and one-quarter of one per cent for wholesalers. This has raised a large amount of money and created quite a good deal of criticism. The cigarette and cosmetic taxes were defeated.

New Jersey.—R. P. Fischelis stated that following some rather sad experiences in obtaining legislation, it was found preferable not to amend an existing statute as it gives the legislators a chance to amend in a way that is undesirable. If the amendment does not go through as wanted, the existing law is lost.

In New Jersey they had found it wiser to supplement with a new act. The first law passed by the present Legislature provides that prescriptions are to be compounded only by registered pharmacists; that a prescription bear the name and address of the customer and be kept on file. In order to substitute ingredients of a prescription the consent of the patron must be given.

Another supplement is the "Barbituric Law." Products included in this law may not be sold at retail except on prescription and under the direct supervision of registered pharmacists.

The Pharmacy Board now has to rule on several points of this law and information is being obtained from manufacturers. A question has come up as to whether prescriptions of that type can be renewed unless advised by the physician. The matter is now before the Attorney General for ruling. Legislation has been responsible for bringing together the various professions

and among these the inspectors' consolidation bill which brings all the boards under one unit. It has been presented several times during the past ten or fifteen years and came very nearly to adoption about three years ago. The Governor asked the president of Princeton University to conduct a survey on the consolidation of state institutions with a view to economize. This was hurriedly done and a great many statistics were used that did not apply at the present time. One of the recommendations made was that the professional boards be consolidated and a conference was had on the proposal. Formerly, the expenses were paid out of the money taken in by the Board but now it has been suggested that the money raised be turned into the fund and an appropriation made to the Board of Pharmacy. A former Attorney General was employed and finally it was agreed that the items be included in the budget, but that the Board be allowed to spend the money as collected and this has worked out very well. Support has been given by the professional groups.

Relative to the "Uniform Narcotic Bill," the editor of the *New York American* conferred with a group of professional people and told them he was going to have the bill introduced by the president of the Senate. Secretary Fischelis called a meeting of drug groups and some changes were proposed, but before these could be printed the bill had been passed. He commented, that this shows the power that is wielded by a large Metropolitan newspaper.

The beer legislation was so worded that local communities could arrange the sale and, as far as he knew, none of the drug stores were selling beer. An opinion was given by the Attorney General prohibiting the sale of drugs by automatic vending machines.

The Legislature is still in session (at this time). A bill was introduced providing that insecticides could only be sold by registered pharmacists.

In speaking of the Pharmacy Board as the sole regulatory body for pharmacy, Dr. Fischelis said that it seemed to him that if these various laws are to mean anything at all, they cannot be left in the hands of county or state officials. They must come under the state boards as these boards are the only bodies qualified to enforce the law. If it is under the State Board of Health a pharmacist should be on the Board, otherwise the Pharmacy Board should have supervision. He thought it was very important for protecting the health of the public. Local officers and district attorneys could not be depended upon to enforce these laws. In New Jersey there is a working arrangement with the Board of Health and in cases of adulteration the Board prosecutes on the ground of protecting public health.

Under the Narcotic Law, the matter of enforcement was left blank as the Board did not desire this work, it being a duty for detectives and not for pharmacists. The Board also did not have the necessary money and considerable money is required for enforcement. Enforcement of laws should be in the hands of those who are qualified.

J. W. Slocum asked why the State Board of Pharmacy bothered with the narcotic act. In Iowa it was left to the Federal government.

Secretary Fischelis said that they had a different proposition to contend with than those of an inland state. There was considerable forging of prescriptions and the reason for the state narcotic law was to give help to the Federal government.

F. V. McCullough stated that the Indiana Board of Pharmacy asked him to advise druggists who violated the narcotic law and warn them. The Federal narcotic inspectors informed him that there had been a number of violations and forging of prescriptions. They had the names of a number of violators who had ordered large amounts of paregoric shipped into the state.

W. H. Rivard stated that in Rhode Island the narcotic law is enforced by Federal officials and that there is little traffic in narcotics and practically no forging of prescriptions.

Connecticut.—A legislative attempt to restrict the opening of drug stores was read by Miss Garvin in the absence of Mr. Beirne, the author. A very brief abstract of this report is given in the following:

It was stated that pharmacists of Connecticut endeavor to pass laws which will serve the future—laws that will benefit the public and majority of druggists. Opposed to class legislation, the druggists of Connecticut consider the interest of the many instead of the few and these thoughts guided them in their legislative efforts during the year. A law was enacted making it illegal to exhibit within or without a store, or advertise by any name that a place of business is a pharmacy, unless a registered pharmacist is the owner or manager. A fine of $200 or thirty days in jail is imposed for violation. A law was passed permitting the sale of certain medicines in stores other

than pharmacies that are distant from regular pharmacies. A tax of $10 is imposed for this privilege in cities of over 5000 population and in small towns a fee of $3 is exacted. Under the new regulations the number of stores dealing in drugs and medicines, outside of pharmacies, will be reduced by one-half or more.

A bill was introduced and passed providing for a fee of $200 for the opening of a new drug store in Connecticut. The bill reads, in part, as follows:

"Any licensed pharmacist, or any person, firm, or corporation employing a licensed pharmacist in a pharmacy, may apply to said commission for a license to sell at retail drugs, medicines and poisons to be used in compounding medicines, and to dispense at retail medicines compounded from prescriptions of physicians, in a pharmacy owned or managed by such pharmacist, or owned or operated by any such person, firm or corporation, provided the pharmacy shall be under the supervision of a licensed pharmacist. Said commission shall grant such pharmacy license when the registration shall be for a new pharmacy on the payment of a fee of $200 and upon satisfactory evidence to said commission that such pharmacy will be conducted in accordance with the rules and regulations of said commission. Renewals of such licenses shall be granted for a period not to exceed one year upon the payment of a fee of $1. When an established pharmacy shall be moved to a new location, it shall be considered a renewal."

Comment was made on this measure in the following.

A fee of $1 had been enacted in Connecticut for the opening of a new drug store. This encouraged the opening of stores that were unnecessary. In passing the new bill officials of the State Department of Health and the State Medical Society were very helpful. The distinction will be noted of a new store and one that has been licensed, when a pharmacy is moved from one location to another the fee of $1 is in force, but if a new pharmacy is opened the $200 fee is required. The bill provides that evidence must be given to the Board of Pharmacy that the location of such a new store is necessary. Heretofore the Board of Pharmacy issued registration certificates to ten or twelve new stores annually, since the new law has become effective only one store has been registered.

Relative to the sale of liquor, anyone who desires to engage in its sale must show his fitness to the Board of Pharmacy; this evidence must also be submitted to the Liquor Control Commission; to a certain extent this also applies to the right of opening a new drug store. The druggist's permit allows the use of alcoholic liquors for the compounding of prescriptions and for the manufacturing of U. S. P., N. F. and other medicinal preparations, provided they are not to be used for beverage purposes, but it does permit, under regulations, the sale of alcoholic liquors in quantities of not more than 1 quart and prohibits the drinking of alcoholic liquors on the premises of any drug store. It will be seen that proper distribution of drug stores rests largely with the Board of Pharmacy and the State Liquor Control Commission. It will not be such an easy matter to open up a new pharmacy because of these restrictions and also because of the $200 tax for the opening of a new store. No applicant who has been in serious conflict with Federal regulations will be eligible for a certificate.

It was stated that copies of the Connecticut legislative program can be obtained by addressing Hugh P. Beirne, chairman of the legislative committee of Connecticut Pharmaceutical Association, 615 Howard Ave., New Haven, Conn.

R. C. Wilson said that an important question was involved in the report by Mr. Beirne. The beer question has brought about considerable discussion and trouble as to its sale in drug stores and this applies also to the sale of liquor.

W. H. Rivard stated that, as far as he knew, there was no other agency contemplated for the sale of any alcoholic liquors, excepting in drug stores.

Ralph W. Clark said there had been trouble with the beer question in Wisconsin. Quite a few druggists want to sell beer and many are now selling bottled beer, but there is a provision of the law which provides that beer cannot be cooled in the place of sale. The cigarette and cosmetic taxes were defeated. There was considerable discussion over allowing assistant pharmacists to become fully registered pharmacists without examination. It passed the Legislature but was vetoed by the Governor. It is understood that the bill will come up again in the special session.

Due to economic conditions the pharmaceutical experiment station was practically wiped out. It was expected that the appropriations would be drastically cut, but it was hoped that the

station could be kept up. The hectic session of the Legislature brought out coöperation among the druggists that had not obtained before.

Rhode Island.—W. Henry Rivard stated that no drastic legislation was passed in Rhode Island. No sales tax was passed and the law regarding assistant pharmacists was strengthened. Provision permitted assistant pharmacists to become fully registered, which after considerable difficulty was vetoed. Such a measure is apt to come up again. An effort is being made to increase the membership of the State association.

John P. Jelinek said that in Minnesota an effort was made to register pahrmacists without examination. The Board of Pharmacy had a conference with the committees of both houses and compromised. It was agreed that a special examination would be held and those passed would be registered pharmacists under the Act. Two examinations were held and about 140 were passed.

W. H. Rivard said that under the law of Rhode Island there can be no further registration of assistant pharmacists. Provision has been made for students in the three-year course until 1936 and for professional men who have been in business since July 1931, to become registered until 1936. Anyone who has been in the drug business for ten years as assistant pharmacist may become a fully registered pharmacist without examination.

South Carolina.—J. M. Plaxco stated that in South Carolina all the nuisance taxes had been proposed. The legislative committee spent the entire session killing two general sales taxes and one other was to give physicians the right to fill prescriptions on their own premises.

Mrs. Fayetta Philip said that many bills were introduced in California relating to pharmacy.

R. L. Swain made a motion that this conference of the Section on Education and Legislation, the Conference of Law Enforcement Officials, and Pharmaceutical Secretaries be continued at future meetings. This was seconded and unanimously carried.

Secretary Kelly expressed his thanks to the officers and those who had prepared the program and his regret, because he had not been able to attend the entire meeting.

On motion duly seconded and carried the meeting was adjourned.

REPORT OF THE 11TH ANNUAL MEETING OF THE PLANT SCIENCE SEMINAR.

BY F. J. BACON, SECRETARY-TREASURER.

The Plant Science Seminar held its 11th annual meeting in Madison, Wisconsin, at the Chi Omega House from August 21 to August 25, 1933. Chairman William B. Day presided at the regular sessions. According to the usual custom the program was divided into scientific sessions, field trips and special lectures on subjects of interest to pharmacognosists.

After registration and a short business session the Seminar visited the University of Wisconsin Medicinal Plant Garden. Dr. W. O. Richtmann conducted the group over the garden and explained the development of the garden from the very modest beginning on the University campus to the present location on University Drive. The plants cultivated and the methods of cultivation employed by the Garden were explained in detail.

At eight o'clock Dr. M. E. Diemer, Director of the Diemer Photographic Laboratories, gave a lecture on Wisconsin wild medicinal plants illustrated with colored lantern slides. The specimens were photographed with color plates in their native habitats and the slides prepared in true color. This beautiful presentation of familiar plants was greatly appreciated by the Seminar people.

Mr. Leroy D. Edwards, of Western Reserve University, School of Pharmacy, presented a paper on "A Study of *Cimicifuga racemosa* (L.) Nutt." The author discussed the methods employed in the treatment of the drug and the results obtained. Sucrose was isolated from the drug. No alkaloid was obtained.

Dr. Heber W. Youngken presented the results of his latest work on Psyllium Seed. Specimens of many varieties of Psyllium were discussed, and the histology and identification of the so-called "Adex Psyllium" as the fruits of *Lallemantia royeleana* Benth. Dr. Youngken illustrated his talk with specimens and drawings and pointed out the danger of using the Lallemantia fruits as a substitute for Psyllium Seed.

Dr. B. V. Christensen, of the University of Florida College of Pharmacy, presented an illustrated lecture on the "Planning and Development of a Medicinal Plant Garden." Dr.

Christensen showed pictures of many tropical and subtropical medicinal plants cultivated in Florida, and discussed their cultivation.

Dr. Ralph Bienfang, of the University of Oklahoma School of Pharmacy, discussed the system of arrangement of drugs taken up in their courses in Pharmacognosy.

The Seminar visited the Forest Products Laboratory Tuesday afternoon. Small groups were formed and conducted through the Laboratory by competent guides. The various projects of the Laboratory were explained. In the evening Mr. J. A. Hall, Biochemist of Forest Products Laboratory, talked to us on "Biogenetics in the Terpene Series."

The Wednesday morning session was held in the Pharmacognosy Department of the University of Wisconsin. Dr. W. O. Richtmann, Professor of Pharmacognosy, explained to us the results of many years' work on the "Sources of Information on Crude Drugs."

Dr. A. H. Uhl, of the University of Wisconsin Course in Pharmacy, presented a paper on the "Phytochemistry of Digger Pine."

Professor C. J. Zufall, Purdue University, presented the results of his work on Cardamom and suggested a method of assay for the seed.

The afternoon was devoted to a boat ride on Lake Mendota. A stop was made to inspect the garden of Dr. and Mrs. Diemer.

Dr. Karl Paul Link, Professor of Biochemistry of the University of Wisconsin, lectured to the Seminar on "Recent Research on the Chemistry of Gums and Pectin." Dr. Link presented to the Seminar an extremely interesting and instructive talk on the structure and chemistry of the gums so widely used in Pharmacy.

The Seminar spent all day Thursday in the field, visiting Blue Mounds, Tower Hill State Park and Taliesin Art Center directed by Frank Lloyd Wright. Lunch, furnished by Eta Chapter of Rho Chi Society, was served at Tower Hill at one o'clock. Many specimens of Wisconsin medicinal plants were collected in the Wisconsin river valley. Dr. Denniston, of the Botany Department of the University, acted as guide.

The Friday morning session was held at the Chi Omega House and Professor E. C. Claus, of the Pittsburgh College of Pharmacy, presented reprints on "Poisonous Plants of Pennsylvania," prepared by Dr. Darbaker.

A classification of our native species of the genus Mentha was given by Dr. F. J. Bacon of Western Reserve University School of Pharmacy.

Dr. Edward Kremers discussed the chemistry of mint oils and brought out the biogenesis of the compounds found in the mint oils.

Professor Canis, of Rutgers University School of Pharmacy, presented a paper on the meaning of Pharmacognosy and discussed the method he uses to present his course.

Chairman Day opened the business session at eleven o'clock and called for the election of officers. The following were elected to conduct the business of the Seminar for 1934: *President*, F. H. Eby; *Vice-President*, L. K. Darbaker; *Executive Committee*, William B. Day, C. E. Mollett; *Secretary-Treasurer*, F. J. Bacon.

Dr. and Mrs. Kremers invited the Seminar to a picnic supper at their home, "The Highlands." After an excellent lunch served on the lawn we were entertained around the campfire by Dr. C. E. Brown, Curator of the Historical Museum. Dr. Brown told many interesting stories about Wisconsin Indians.

The following members and guests attended the Seminar in Madison:

C. C. Albers, University of Texas, Mrs. C. C. Albers
F. J. Bacon, Western Reserve University, Mrs. F. J. Bacon
Ralph Bienfang, University of Oklahoma
J. B. Burt, University of Nebraska, Mrs. J. B. Burt
F. S. Bukey, University of Nebraska, Mrs. F. S. Bukey
O. P. Canis, Rutgers University
P. D. Carpenter, University of Illinois
B. V. Christensen, University of Florida, Mrs. B. V. Christensen
E. C. Claus, Pittsburgh College of Pharmacy, Mrs. E. C. Claus
R. W. Clark, University of Wisconsin, Mrs. R. W. Clark

William B. Day, University of Illinois, Mrs. William B. Day
L. D. Edwards, Western Reserve University
W. W. Eggleston, Bureau of Plant Industry
F. H. Eby, Temple University, Mrs. F. H. Eby
P. A. Foote, University of Florida, Mrs. P. A. Foote
E. N. Gathercoal, University of Illinois, Mrs. E. N. Gathercoal
Miss Katherine Graham, University of Wisconsin
E. J. Ireland, University of Wisconsin
R. S. Justice, Ohio State University
Edward Kremers, University of Wisconsin, Mrs. Edward Kremers
Miss Mary Langevin, University of Nebraska
W. O. Richtmann, University of Wisconsin, Mrs. W. O. Richtmann
F. J. Slama, University of Maryland, Mrs. F. J. Slama
A. H. Uhl, University of Wisconsin
Miss Nellie Wakeman, University of Wisconsin
E. H. Wirth, University of Illinois
H. W. Youngken, Massachusetts College of Pharmacy
Sister Mary Francis Xavier, University of Wisconsin
C. J. Zufall, Purdue University, Mrs. C. J. Zufall.

HOURS IN EUROPEAN PHARMACIES.

The International Pharmaceutical Federation has investigated the hours of opening and closing of pharmacies. The questionnaire was as follows: (*a*) Are there any regulations relating to the closing of pharmacies? (*b*) Are these regulations of general, provincial or local application? (*c*) Are these regulations issued by some competent authority, or by pharmaceutical organizations?

Among the replies received from twenty-one countries, and published in the Bulletin de la Federation Internationale Pharmaceutique, are the following:

Austria.—There are no official regulations. In Vienna pharmacies close at 7:00 P.M., and this closing hour, with slight variations, is general in Austria. Evening and night duty is undertaken by rota. In Vienna on every second Sunday pharmacies must close from 1:00 P.M. until Monday at 7:00 A.M., without obligation to provide a night service. Service for Sundays and holidays is officially regulated.

Czechoslovakia.—Pharmaceutical service must be given uninterruptedly, and is regulated by a law of 1908, augmented by orders of departmental authorities which are published in cooperation with pharmaceutical organizations. These regulations are based on an eight-hour working day. Pharmacies are open from 8:00 A.M. to 7:00 P.M.—8:00 P.M. In places where there is only one pharmacy the pharmacist has the right (on authorization) to close from 12 M. to 2:00 P.M., and may close on Sunday afternoon if he agrees to supply urgent medicines.

Esthonia.—There is a legal obligation for a pharmacist to supply medicines at any hours. This is of general application. In towns with several pharmacies night service is given by districts, the rota being arranged by the Director of Pharmacies. Opening hours are from 8:00 A.M. to 8:00 P.M., and may close on Sunday afternoon if he agrees to supply urgent medicines.

Finland.—Closing hours are not regulated by law, but an order stipulates that pharmacies must give a day or night service if required. By Par. 14 of an order of December 17, 1928, the medical authorities can determine the hours of service.

Greece.—By a decree of the Ministry of National Economy and Police, pharmacies are to be open from 8:30 A.M. to 1:00 P.M., and from 3:00 P.M. to 8:30 P.M. to 1:00 P.M. and from 4:00 P.M. to 9:00 P.M. in March, April, October; from 7:30 A.M. to 1:00 P.M. and from 4:00 P.M. to 9:00 P.M. in May, June, July, August, September. These regulations apply only to towns. On Sundays about a quarter of the pharmacies are open.

Switzerland.—Regulations for closing and hours of service vary in different cantons. In the majority of towns there is a regular night service as well as a Sunday service by rota. In Zurich regulations have been drawn up by the pharmacists, and accepted by the sanitary authorities.

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1933–1934.

Office of the Secretary, 2215 Constitution Ave., Washington, D. C.

December, 22, 1933.

LETTER NO. 5.

To the Members of the Council:

27. Sale and Exchange of Liberty Bonds. Motion No. 5 (Council Letter No. 4, page 1302) has been carried. Before the vote was received the called bonds had declined slightly in price as compared to the uncalled bonds. The registered called bonds listed were sold at 101 and the uncalled coupon bonds to replace were purchased at 101 21/32. To illustrate, two $1000 registered bonds in the Endowment Fund brought $2018 net and two $1000 coupon bonds to replace cost $2035.13 net. It was decided to sell the two $100 coupon bonds in the Headquarters Building Fund and the one $100 coupon bond in the Procter Monument Fund and not replace them. The former brought $101 30/32 and the latter $101 14/32.

In view of the difficulty of transferring registered bonds as further issues are called and as the coupon bonds bring a slightly better price, it seemed advisable to purchase coupon bonds.

28. Election of Members. Motion No. 6 (Council Letter No. 4, page 1304) has been carried and applicants numbered 10 to 56, inclusive, are declared elected.

29. Contract for Printing and Mailing the Journal of the A. Ph. A. for 1934. The following letter has been received from Chairman DuMez of the Committee on Publications:

> "I have checked over the bids for publication of the JOURNAL obtained by Editor Eberle, very closely, and I am unable to discover how we would benefit by changing the publisher at this time.
>
> "Some of the estimates are very near that of the present publishers, but the expenses in making a change would more than make up the difference.
>
> "Editor Eberle informs me that the service has been entirely satisfactory, and I therefore recommend to the Council that the contract for publishing the JOURNAL for the coming year be renewed with the Mack Printing Company."

(*Motion No. 7*) *It is moved by DuMez that the contract for printing and mailing the Journal for 1934 be awarded to the Mack Printing Company of Easton, Penna.*

At the request of Chairman DuMez a vote is called for at this time but will be considered as tentative if there is objection.

30. Budget for 1934. Chairman Swain of the Committee on Finance submits, in accordance with Article II of Chapter II of the By-Laws of the Council, the following report on appropriations and expenditures for 1933, with a suggested budget of receipts and appropriations for 1934, which were prepared by the secretary and approved by the chairman of the Finance Committee. The officers and Finance Committee are fully aware of the difficult times we are going through, which have resulted in reduced receipts, and several items in the proposed budget have been again reduced, while others must be increased, the total being more than one thousand dollars less than for 1933.

"To the appropriation for General Expenses in 1933 nothing has been added. Of the appropriations, only two have been exceeded to December first, and these are within the $50 limit for which Council action is not required. They are the appropriations for the Scientific Section $27.41 against $25, and the Section on Historical Pharmacy $30.97 against $25. Every effort has been made to keep the expenses below the budget appropriations. Charges to December 1st were $16,071.84 as against $21,580 appropriated.

"Under the appropriations for open accounts to December 1st, the JOURNAL has cost $10,791.58 against the $11,000 appropriated, the N. F. $4008.68 against the $1800 and the Recipe Book $56.13 against the $500. No charges were made against the appropriation of $50 for Badges and Bars. Charges to December 1st were $14,856.39 against the $13,350 appropriated.

"To December 1st the total budget charges were $30,928.23 against appropriations of $34,930 for the year, so we will probably not exceed our total budget.

"The receipts show considerable variation from the estimates. From Dues, $7727.38 as compared to $8571.88 for the same period in 1932. Every effort has been made to hold this figure up, but many explain that they cannot afford the expense. Bills for dues for 1934 were mailed on December 1st, and we cannot say what the total for the year will be. From the JOURNAL $7271.15 as against $7862.54, which is very satisfactory under present conditions. From the N. F., $3954.36 for the year as against the estimate of $3500, which is very encouraging. From the Recipe Book, $894.94 for the year against the estimate of $1500, which again shows a decided decline. The receipts from interest on Headquarters Building Fund will be about $5000 as compared to the estimate of $4000. $1000 was received from the U. S. P. Board of Trustees for the YEAR BOOK, and sales were $115.19.

"It has been necessary to use the income from the Life Membership Fund for the year and to transfer $5000 of accumulated interest to the Current Fund."

BUDGET FOR 1934.

It is very difficult to estimate receipts under present conditions. The following is suggested:

Interest	100.00	
Dues	$13,000.00	
Interest Life Membership Fund	4,500.00	
JOURNAL	9,500.00	
National Formulary	3,500.00	
Recipe Book	1,000.00	
YEAR BOOK	2,200.00	$33,800.00

APPROPRIATIONS FOR GENERAL EXPENSES.

No. 1	Salaries	$10,800.00	
No. 2	Maintenance of Building	1,800.00	
No. 3	Telegraph and Telephone	200.00	
No. 4	Clerical Expenses	1,600.00	
No. 5	Printing, Postage and Stationery	900.00	
No. 6	Office Supplies	150.00	
No. 7	Traveling Expenses	300.00	
No. 8	Premium on Bonds	50.00	
No. 9	Auditing	75.00	
No. 10	Certificates	50.00	
No. 11	Miscellaneous	200.00	
No. 12	Scientific Section	25.00	
No. 13	Section on Education and Legislation	25.00	
No. 14	Section on Practical Pharmacy and Dispensing	25.00	
No. 15	Section on Commercial Interests	25.00	
No. 16	Section on Historical Pharmacy	25.00	
No. 17	Commission on Proprietary Medicines	25.00	
No. 18	Committee on Local Branches	25.00	
No. 19	Committee on Membership	250.00	
No. 20	Committee on State and National Legislation	50.00	
No. 21	Committee on Syllabus	50.00	
No. 22	Committee on Pharmacy Week	250.00	
No. 23	Inter-Society Color Council	25.00	
No. 24	International Pharmaceutical Federation	120.00	
No. 25	Metric Association	10.00	
No. 26	American Conference on Hospital Service	25.00	
No. 27	Headquarters Building Campaign	500.00	
No. 28	YEAR BOOK	3,500.00	
No. 29	Library	50.00	$21,130.00

APPROPRIATIONS FOR OPEN ACCOUNTS.

No. 30	JOURNAL:			
	(*a*) Publication	$9,500.00		
	(*b*) Clerical Expenses	1,000.00		
	(*c*) Postage and Stationery	300.00		
	(*d*) Freight, Drayage and Miscel.	200.00	$11,000.00	
No. 31	National Formulary		1,000.00	
No. 32	Recipe Book		500.00	
No. 33	Badges and Bars		50.00	$12,550.00
				$33,680.00

"With these reductions it will be necessary to further curtail expenses wherever possible. The reductions suggested will interfere with the work of the ASSOCIATION but not seriously. It will be necessary to keep the JOURNAL within the appropriation, which will mean abstracting or condensing many papers and articles, and to advance the extra charges for the completion of the revision of the N. F. It is impossible to even estimate at this time what the maintenance of the Building will cost."

(*Motion No. 8*) *It is moved by Swain that the budget for 1934 be approved as submitted.*

With the approval of the chairman of the Council a vote is called for at this time. It will be considered as tentative if there is objection.

31. Selection of Auditors. The Chairman of the Committee on Finance recommends the employment of W. A. Johnson & Co., Baltimore, Md., to audit the accounts of the ASSOCIATION for 1933, in accordance with Article 8 of Chapter IV of the By-Laws. This Company has audited the accounts since 1922.

(*Motion No. 9*) *It is moved by Swain that W. A. Johnson & Co. be employed to audit the accounts of the Association for 1933.*

32. Applicants for Membership. The following applications properly endorsed and accompanied by the first year's dues have been received.

No. 57, Fred C. Allen, Marlinton, W. Va.; No. 58, E. W. Bobst, Nutley, N. J.; No. 59, Paul M. Rogers, 233 High St., Morgantown, W. Va.; No. 60, Richard T. Buerstatte, Jr., Manitowoc, Wis.; No. 61, George E. Crossen, College of Pharmacy, University of Minnesota, Minneapolis, Minn., No. 62, Herman Emde, 5 Besselstr. Konigsberg i/Pr., Germany; No. 63, Marion D. Falconer, 223 E. Alberta St., Anaheim, Cal.; No. 64, Maurice Goldman, 3809 Waverly Ave., East St. Louis, Ill.; No. 65, Edgar E. Goulet, 443 Lake Ave., Manchester, N. H.; No. 66, Irvine Walter Grote, 2211 Union Ave., Chattanooga, Tenn.; No. 67, Jonathan Gordon, 377 Eastern Parkway, Brooklyn, N. Y.; No. 68, Ernest K. Hoge, 1012 Main St., Wheeling, W. Va.; No. 69, John J. Law, 468 Third Ave., West Haven, Conn.; No. 70, Alfred Rapps, 1010 E. 2nd St., Plainfield, N. J.; No. 71, Alfred Edward Rheineck, 2469 N. 2nd St., Milwaukee, Wis.; No. 72, Eleanor Martha Uhlir, Walnut, Neb.; No. 73, Melvin B. Vogt, 3481 Fairmount Blvd., Shaker Heights, Ohio; No. 74, William Vollmer, 330 W. 42nd St., New York, N. Y.

(*Motion No. 10*) *Vote on applications for membership in the American Pharmaceutical Association.*

33. The Headquarters Building. The offices of the ASSOCIATION will be removed from 10 W. Chase St., Baltimore, Md., to the Headquarters Building, 2215 Constitution Avenue, N. W., Washington, D. C., on or about January 1, 1934.

The grading of the grounds was completed sometime ago. The approach-steps are nearing completion and the roadway across the grounds in the rear of the building is completed. The top-soiling is being done as well as part of the planting and seeding. The remainder of the planting and seeding will be completed early in the spring.

The grading, approach-steps and roadway are being done by the George A. Fuller Company, Washington, D. C., and the top-soiling, seeding and planting by the Westcott Nurseries, Falls Church, Va. The Office of John Russell Pope is supervising all the work and Mr. A. F. Brinckerhoff, New York, N. Y., is the consulting landscape architect.

A decision has been secured from the authorities of the District of Columbia that the building and grounds will be free from taxation after occupancy.

E. F. KELLY, *Secretary.*

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

BALTIMORE.

The regular monthly meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Hotel Emerson on January 3, 1934. President Solomon, in the chair, called for reports of the various standing committees and for the secretary-treasurer's report for 1933.

The secretary read the report for the past year and noted a marked improvement in the attendance. The treasurer's report was then read. The financial status of the Baltimore Branch is sound with a comfortable balance of over $200 on deposit. The reports of the secretary-treasurer were accepted.

Dr. Swain, chairman of the Committee on Legislation and Education, reported on the fate of the Uniform Narcotic Act in Maryland; the Liquor Bill; the N. J. Legislation on tolerances on prescriptions; the Kansas Drug Store Registration Act; the Kentucky Pharmacy Act; the Drug Store Ownership Laws, and the new Federal Food and Drugs Act.

B. Olive Cole, chairman of the Membership Committee, reported that membership in the parent organization in Maryland has held up very well.

Marvin J. Andrews, chairman of the Committee on Science and Practice of Pharmacy, reported in detail the research work carried out in Baltimore at the Emerson Drug Company; the Department of Pharmacology of the School of Medicine, University of Maryland; the Maryland State Department of Health; Hynson, Westcott and Dunning; and the School of Pharmacy, University of Maryland.

The secretary expressed the regrets of Editor Eberle, chairman of the Committee on Professional Relations, for not being able to attend the meeting and read the report of this committee.

The committee reports were accepted as read.

Mr. Black, the first speaker of the evening, presented an interesting paper in which he stressed the importance of careful dispensing. He further urged that a more friendly coöperation should be attempted between physicians and pharmacists.

Mr. Meyer, a retail pharmacist of many years' experience, presented an interesting demonstration and display of the many devices which he employs in his business to increase efficiency.

Thanks were extended to the speakers. President Solomon then called upon Mr. Lowery of the Nominating Committee for a report. The following were nominated and duly elected to office for the year of 1934: *President*, B. Olive Cole; *Vice-President*, W. F. Reindollar; *Secretary-Treasurer*, C. Jelleff Carr.

After the installation of President Cole, Dr. Swain presented a motion, which was carried, that the Branch present yearly another membership in the A. PH. A. to a student in the School of

Pharmacy, University of Maryland, to be selected by the Faculty. This membership was also to carry with it membership in the Baltimore Branch.

After a few words about arrangements for the February meeting a motion for adjournment was passed.

C. JELLEFF CARR, *Secretary-Treasurer.*

CINCINNATI.

The last regular meeting of the Cincinnati Branch, A. PH. A., was held Tuesday night, January 9, 1934, at the Cincinnati College of Pharmacy.

President Sondern introduced Dr. Shiro Tashiro, professor of Biochemistry at the College of Medicine, University of Cincinnati. Dr. Tashiro spoke on, "Pharmacy in the Orient." This subject could well have borne another title as he explained in the beginning of his talk. Dr. Tashiro dwelt chiefly on the superstitious ideas, beliefs and odd remedies as he remembered them practiced in his native land years ago. It was shown, however, that many of these odd remedies have since been exonerated by the teachings of modern science. Proof of this was amply given in his examples of the school boy, the chewing of water, the death of the town barber, etc. In 1895 Dr. Tashiro's village felt the influence of the Occident. From that time on Science became the God of the people and the West their ideal.

Dr. Tashiro was given a standing vote of thanks.

The minutes of the previous meeting were read and approved.

The report of the Committee on Pharmaceutical Jurisprudence was submitted by Mr. Freericks. He told of a proposed amendment to the Food and Drugs Act written by Dr. Beal. This contains some very desirable features, particularly that dealing with a partial disclosure of formulas of a toxic nature. Dr. Copeland, he reported, is also rewriting his proposals. Mr. Freericks requested that in order to make better reports on this committee the members ask specific questions.

The report of the Publicity Committee was given by Mr. Henke. All papers were notified of this meeting and one gave generous space to the details of Dr. Tashiro's speech.

Mr. Cassidy reported for the Drug Products Committee. This committee will report on new products on the market and investigate and report on those of dubious nature. Mr. Cassidy reported on the new British product of Pure Vitamin C in crystal form. A detailed report on this product will be given at the next meeting.

A motion was made, seconded and passed that the Branch appoint an historian.

The secretary will endeavor to get more space in the JOURNAL for the reports of our meetings.

Mr. Jennie in behalf of the O. V. D. A. invited all members to attend the installation of officers of the organization at the Netherland Plaza, January 30, 1934.

The meeting adjourned and all members partook of refreshments ably handled by the Refreshment Committee.

R. L. PULS, *Secretary.*

DETROIT.

The meeting of the Detroit Branch, AMERICAN PHARMACEUTICAL ASSOCIATION, was held on the evening of December 21st, at Webster Hall. Due to the absence of the chairman, Henry Tyszka presided. Secretary Bialk was absent on account of illness and Prof. Charles H. Stocking acted as secretary *pro tem.* The minutes of the November meeting were read and approved.

Secretary S. R. Klegan of the Detroit Registered Pharmacists' Association explained the purpose and aims of the organization. In part, he said, "The purpose of the drug clerks' organization is not to hold a club over the heads of the proprietors to compel the payment of higher wages, but rather to work with the proprietors in an effort to assist them to make larger profits so that the payment of higher salaries will become possible. He further stated that the new organization came into existence because the clerks did not feel that they could secure the desired results through active membership in the Detroit Branch, A. PH. A. as it attracts into its ranks only the best element in pharmacy and therefore efforts to bring influence to bear upon the less desirable members of the profession would be lost."

Mr. Klegan stated that the members of the Registered Pharmacists' Association do not expect to dictate to their employers nor to use the labor union methods to achieve their aims. He was of the opinion, however, that much good could come to clerks and proprietors through the activities of the association.

L. A. Seltzer contended that the proprietors have serious problems of their own and that in no business is the interest of the clerk and that of the proprietor so closely related as in pharmacy. He thought that closer coöperation between the clerks and the proprietors could be best worked out through the medium of the friendly exchange of ideas in an organization such as the Detroit Branch, where both classes meet on an equal footing. This opinion was shared by James Liddell, who stated that the clerks profit by the experience of the older members.

Dean R. T. Lakey complimented the new organization on the initiative shown by the membership in attacking the problems of the clerks and stated that he felt much good could be accomplished. He contended that because of the large number of clerks, compared with the number of drug store owners in the state, great power lies dormant in the hands of the clerks.

The meeting was well attended, considering the fact that it was scheduled so close to the holiday season.

CHARLES H. STOCKING, *Acting Secretary.*

NEW YORK.

The December meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in the Brooklyn College of Pharmacy, Long Island University, on December 11, 1933. There were about sixty members and guests present.

Vice-President Ballard was in the chair and he expressed the regrets of Dr. Bilhuber for his inability to attend. The report of the secretary was read and accepted.

Chairman Lehman, of the Education and Legislation Committee, reported three points of importance;

First: The NRA Retail Code is unsatisfactory. Considerable difficulty is being experienced with the definition for cost of merchandise.

Second: The Tugwell Bill. Objection is being raised to the "one-man rule."

Third: Passing of prohibition; Mr. Lehman called attention to the fact that a physician's prescription is still necessary in the sale of liquor in a drug store. The sale of alcohol is prohibited.

Chairman Kassner, of the Membership Committee, reported Mr. Bragger, a new member for the Association.

Dr. Arny reported on the organization meeting of the Northern New Jersey Branch of the A. PH. A.

Vice-President Ballard appointed a nominating committee to report at the next meeting: *Chairman*, Hugo H. Schaefer; R. A. Lehman and Reginald Dyer.

Dr. Ballard then called upon Mr. Heimerzheim to say a few words regarding Dr. Joseph L. Mayer, whose untimely death had occurred but a few days before the meeting. Mr. Heimerzheim spoke of Dr. Mayer as a classmate and friend, and called attention to the sincere and faithful service performed by Dr. Mayer in his work in the Brooklyn College of Pharmacy.

Members and guests were asked to rise and stand in silent tribute to a beloved member.

Chairman Heimerzheim, of the Committee on the Progress of Pharmacy, then reported the following:

1. Investigations have shown that the rate of deterioration in aqueous solutions of gallotannic acid preserved at a temperature of 60° to 65° F. is negligible over a period of six months.

2. The modern treatment of strychnine poisoning consists chiefly and preeminently in the intravenous administration of sodium amytal.

3. Alkali stannites are now being used as active ingredients in preparing depilatories.

Dr. Ballard then introduced the speaker for the evening, Dr. Ralph Holt Cheney, who spoke on the "Relation of Caffeine and Coffee to Human Efficiency." (To be published in a succeeding number of the JOURNAL.)

At the close of Dr. Cheney's address there was some discussion, and after the speaker had answered numerous questions the meeting adjourned. RUDOLF O. HAUCK, *Secretary.*

NORTHERN NEW JERSEY.

The fourth regular meeting of the Northern New Jersey Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was called to order by President Little on December 18th.

After a brief word of greeting to the many visitors by the president, our first two new members, Doctor L. K. Riggs and Professor W. L. Sampson, were introduced, and the fourteen persons whose names follow were nominated for membership in the branch and elected: They are Hyman Aberbach, Philip Basson, Annabel Beaty, John J. DeBus, John G. Graef, Albert Hawes, Milton Kahn, George Lordi, O. H. Florenzie, Abram Mosler, Janette B. Osofsky, W. H. Owens, Alfred Rapps and Robert Wuensch.

A special occasion was made in the subsequent program of the association for the election of Dr. R. L. Swain to honorary membership. The branch is very proud to have as its first honorary member the president of the parent body.

One of the most interesting reports of the evening was that presented by Mr. Mecca, speaking for the Professional Relations Committee. He outlined plans for two joint meetings to be held in the early spring, one with the physicians, and the other with the dentists. Features at both programs will be combined lectures and demonstrations on things pharmaceutical which will be of considerable interest to our professional friends.

Professor Cox, reporting for the Committee on Science and Practice of Pharmacy discussed some of the recent advances in manufacturing, the desirability of state boards being more careful about the character of licensed pharmacists, the future of liquor in drug stores, the work of the New York State Board in analyzing samples of merchandise purchased at cut-rate drug shops, and Judge Pound's decisjon that Pharmacy is a profession, analogous from a training standpoint with law and medicine.

At the completion of the regular order of business President Little introduced Mr. Vail, of Becton, Dickinson & Company, who gave us a very nice prologue to the instructional entertainment his company was presenting as the feature of the evening. This was to be a lecture and bench demonstration on the manufacture and use of clinical thermometers.

When Mr. Vail had concluded his talk W. G. Meriam began the lecture with the story of the development of the thermometer from the first crude instrument of Galileo to the precision clinical thermometer of to-day. As he began discussing the bench work involved in the making of thermometers, Hugo Barthen, his assistant, carried out each delicate operation while it was being explained. The intricacies of the manufacturing processes were most capably demonstrated. After the formal talk the meeting was adjourned and we were permitted to gather around the work bench where both Mr. Barthen and Mr. Meriam were kept busy with repeated demonstrations and the answering of questions.

L. W. RISING, *Secretary.*

NORTHERN OHIO.

The Northern Ohio Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION met January 12, 1934, at the Faculty Club of Western Reserve University; twenty-two members were present.

After installation of officers for the new year (the names of the new officers are listed in the roster of the A. PH. A., Local Branches of THIS JOURNAL) the time of the meeting was taken up with the discussion of a newly adopted method for contacting the 1400 physicians whose names appear on the roster of the Cleveland Academy of Medicine. Hereafter bulletins of a general nature only will go directly to physicians, while members of the Academy of Pharmacy will be supplied with sufficient type prescription cards and information that will be serviceable when the physicians of their neighborhood are detailed or contacted.

PHILADELPHIA.

The December meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Philadelphia College of Pharmacy and Science on Tuesday evening, December 12, 1933.

The meeting was called to order by President Eby, who notified the assembly of the recent death of Mr. Joseph W. England, president of the Branch in 1921, and appointed Dr. LaWall and Dr. Krusen as a Committee to draw up a resolution of sympathy to be presented by the Phila-

delphia Branch to the family of the deceased. Dr. LaWall recalled phases of Mr. England's life bearing on the advancement of American Pharmacy.

Ivor Griffith, speaker of the evening, Associate Professor of Pharmacy at the College, Director of Research at the Stetson Laboratories and Editor of the *American Journal of Pharmacy*, was then introduced to present the topic "Dyes and Disease."

He began with a history of the use of dyes therapeutically, giving his version of the discovery of the famous "Perkin's Purple" in 1856 during the search for a synthetic quinine. With a lecture table experiment he then produced a quantity of the "Perkin's Purple."

Professor Griffith stated that the dyestuffs commonly used in medicine were mostly toxic, especially the basic dyes, and that in dilute solutions they were antiseptic. Reduction of surface tension was suggested as a topic of research in the medicinal use of dyes. The textile industry has developed certain detergents which reduce the surface tension of the dye-bath, thus permitting greater penetration. The therapeutic value of many dyes could be greatly enhanced if the surface tensions of their solutions might be reduced. To be of value in the treatment of disease a dye should persist in the tissue until its work is accomplished, and then disappear. Mention was made where overdoses of certain dyes produced startling results and changes in the appearance of the patient.

Professor Griffith confined his talk mainly to a discussion of the chemical dyes, of the basic and fluorescein groups. With regard to the recent use of methylene blue as an antidote in carbon monoxide and cyanide poisoning, he said that it was now supposed that the dye occupied the place of the oxidizing enzyme in the blood, until recovery enabled the enzyme to again function properly.

The lecture was accompanied by a series of practical experiments illustrating the properties of the dyes mentioned. Charts were displayed, one showing 22 possible colors obtainable by combining three dyestuffs of cardinal colors. The new 1934 color chart displayed the 80 colors to be used by clothing manufacturers during the coming year and Professor Griffith said that to date about 1500 color shades were on record.

At the close of the lecture Dr. LaWall commented on the use of dyes in food coloring, and said that vegetable colors were not the only ones suitable, and that many synthetic dyes could be used satisfactorily.

Dr. Munch made some interesting comments on the poisonous effects of certain dyes that have been used as food colors. Dr. Bird announced the possession of a sample of the original mauve, so popular in England after its discovery, and offered to share his sample with the College Museum. This offer was accepted on behalf of the curator by Dr. LaWall.

The meeting adjourned at 9:45 with a rising vote of thanks to the speaker.

E. H. MACLAUGHLIN, *Secretary.*

PITTSBURGH.

A meeting of the Pittsburgh Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday evening, January 16, 1934, in the main lecture room of the Falk Clinic at 3601 Fifth Ave.

PROGRAM.

"Exhibition of X-ray and Fluoroscopic Technique," Mr. John Russell, Falk Clinic. 7:30 to 8:30 P.M.

"A discussion of Mouth Antiseptics and Dentifrices," W. Harry Archer, D.D.S., Dental School, U. of Pittsburgh.

"Analgesics, Anodynes and Sedatives Used in Dentistry," W. Paul Walker, D.D.S., Dental School, U. of Pittsburgh.

Wilbur L. Scoville, for many years member of the technical staff of Parke, Davis & Co., well and favorably known for his work in the advancement of pharmacy, is on the retired list. Mr. and Mrs. Scoville are now in Florida. No doubt, Professor Scoville's activities for pharmacy, especially in the revisions of the U. S. P. and N. F., will long continue. Best wishes for health and happiness are extended.

SYMPOSIUM ON PRACTICING PROFESSIONAL PHARMACY.*

How Hospitals Can Profit by Adopting a Formulary and Chart and Engaging the Services of a Registered Pharmacist.

BY HARRY E. BISCHOFF.

There are generally four types of Hospitals.

1st—Municipal.

2nd—Those partly supported by municipal appropriations.

3rd—Incorporated institutions financed by endowments, by religious or civic organizations, or by individual support.

4th—Private Hospitals.

The second and third types are greater in number as they embrace all hospitals operating under the auspices of religious and civic organizations. Even in large cities where there are City Hospitals, there are usually a number of these privately or semi-privately operated hospitals, which as a whole, render far more service than the city institutions.

To install a pharmacy or a pharmaceutical laboratory in a hospital where none has operated, it first becomes necessary to persuade the governing body that it will save the institution money. This is preferably accomplished through the Superintendent or Medical Director or whoever may be the directing head. The plan should be referred to the Medical Staff and a committee appointed, representing all departments of the hospital and including a trained pharmacist. A competent pharmacist, through his familiarity with official medicines and official titles and costs of drugs, can be of much assistance in preparing a suitable Formulary and in advising upon the available standard medicines and their price in comparison with the many specialities. The pharmacist necessarily must be conversant with medical terms, action of drugs, types of medication and, principally, comparative costs of proprietary and official preparations. He must drive home the point that all standards for drugs and medicines are defined in the U. S. P. and N. F., and manufacturing firms have only one recourse and that is to buy their supplies through the same sources that pharmacists do, hence fancy names naturally command fancy prices. To put into effect the prescribing for U. S. P. and N. F. drugs and preparations in lieu of proprietaries, a Hospital Formulary and Chart are needed to properly carry out the plan, since without them the staff has no guidance.

To win the support of the Medical Staff, first of all, their pharmaceutical wants and needs should be taken into consideration as they generally have some pet formulas. Then the thought of teaching the internes the art of prescribing is the next feature. This we know is one of the duties of the staff in rounding out the experience and practice that internes must necessarily obtain in hospitals. Most State Boards demand at least one year of rotating service in a Class "A" Hospital as a requisite before taking state examinations and the Formulary in turn also aids as a course in Materia Medica and the allied subjects that they are examined in. Hospital Staffs are just as zealous of the records of their internes taking state examinations as are our Schools of Pharmacy. The Staffs of hospitals watch more closely the results of state examinations regarding their internes than they do the schools from which they graduate.

The Hospital Formulary should be published in a practical manner in order that it can be readily referred to.

In addition to the printed Formulary, the formulas are also printed on a chart. This is put up in all wards, clinics, and at each floor supervisor's station, and can readily be referred to by those on service, should they be without their Formulary, which is of pocket size. As a matter of fact, the charts are referred to more frequently than are the books. The books are generally perused leisurely at the office of the practitioner or by the internes during rest periods. This also encourages the practitioner to prescribe U. S. P. and N. F. preparations in his regular practice and is far reaching in its influence. As for the interne, it is the means of educating him to prescribe other than proprietary preparations and when he opens his office, he is not so likely to write for the many specialties which are ordinarily found on his prescriptions.

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* See page 1021, October JOURNAL, and page 1279, December issue.

The nurse, also profits immensely by knowing the chart as it affords her the opportunity to study the medicinal terms and greatly aids her with her materia medica.

Most hospitals to-day are endeavoring to make each department carry itself from a standpoint of costs, and it is a known fact that the Pathology department and the X-ray department show a profit often in sufficient amount to carry their clinics.

The drug department at the North Hudson Hospital also provides an income, for as each patient is billed for a laboratory charge (this work is compulsory by a ruling of the American College of Surgeons in order to attain a class "A" rating) and for X-ray work, if the same is necessary, so are they billed for medication, whether they be ward or private patient. If ward patients—at a minimum charge, just sufficient in amount to cover costs, if private—at usual prescription rates. Of course if a flat rate is given for ward patients, including all costs, nevertheless, the work done in the pharmacy is billed to the office and the pharmacy credited, just as they bill and receive credit for private work. At the North Hudson Hospital prescriptions are billed for both ward and private patients under one listing. In order that this may be properly summed up, the important facts are as follows: this Hospital, a general hospital of 160 beds, 2 operating rooms, doing all types of work (except handling contagious diseases), has day and night ambulance service and 11 different types of clinics, and giving medical and surgical service. The pharmacy only handles drugs and medicines. The control of gauze, cotton, etc., is under another department, whereas, some hospitals include these with their drug department. All chemicals, pharmaceuticals, drugs, etc., such as disinfectants, etc., are charged to the institution as a whole, whether it be a general laxative or anything else—at cost price.

For comparative purposes, the records of 1931–1932 speak for themselves:

	1931.	1932.	Increase.
Prescription Account	$4050.69	$5133.65	$1082.96
House Account	3847.15	3714.66	—132.49
	$7897.84	$8848.31	$ 950.47

You will note that the House Account was slightly less in 1932 than in 1931 and this was, principally, because prices were lower as the amount of materials used was greater in quantity. The largest items in the House Account are principally for disinfectants and germicidal agents such as Liquor Cresolis Compositus, Liquor Soda Chlorinata and Liquor Formaldehyde, etc., for washing floors, etc.

Bearing in mind the fact that costs were much higher in 1931 than 1932, the above figures prove that the Staff favors this service more than ever and appreciates the fact that U. S. P. and N. F. preparations meet all medical needs because there are no "patents" or "proprietaries" whatsoever in our drug department.

This year to date, notwithstanding the times and costs, the Drug Department is showing even a greater income. Of course, the wards are overflowing and private rooms are now usually occupied by ward patients at ward rates, which also means medication at cost.

The cost of installing our Pharmacy fully equipped, which replaces our former drug room, was accomplished at a cost of less than $900. This includes everything—carpenter work for making of the counter, drawers, shelves and closets, plumbing work of replacing a small sink with a large deep sink with a single unit for hot and cold water faucet with foot control, large enough to wash and clean five-gallon containers, electrical work of installing 4 outlets for lights and gas connections for 2 burners. The balance was spent on utensils, bottles, jars, spatulas, scales, weights, mortars and pestles, pill machine, graduates, etc. The stock bottles for galenicals, etc., costs were nil because these were collected over a period of time and we painted the names and numbers on them with white enamel which permits washing and keeps for about three to four years, even under constant usage. This not only kept down the costs but is also far more satisfactory than paper labels, and superior to glass labels, which crack and break. These containers can be readily washed and kept cleaner, and the labels are more durable. When I say fully equipped, I mean just that, since this figure includes stock of galenicals, chemicals, drugs, etc., for about four to five months' supply. Some, of course, last longer, while others are continually being reordered.

We have a full-time pharmacist who works from 9:00 A.M. to 5:00 P.M. and two nights a

week from 7:00 to 8:30 o'clock. Sundays and holidays he is on from 9:00 A.M. until 12:00 A.M. He has the assistance of a clinic nurse when necessary, and the cleaning is done by a porter.

The cost of materials and supplies for 1931 were $1769.19 and for 1932 they were $1235.37. There were some additional interlocking items that partly belonged to the drug department but because they were principally for the pathology or other departments, they were charged elsewhere. At the most, they wouldn't amount to more than $200 during any year.

These facts presented show that a drug department can produce equally as much revenue as the Pathology or X-ray departments of hospitals, if properly handled. The profit for 1931 was approximately $4208.65 and for 1932 it was $4672.94, against which should be charged space consumed, light, heat, water, insurance and depreciation.

If an attending physician wishes to prescribe a proprietary for a private patient, that is his privilege, it is procured elsewhere. However, for ward and clinic cases, the Staff is subject to rules and must confine its prescriptions to official drugs or preparations. At first this was an effort, but after they found that they obtained results from official preparations, the battle was won. I clearly proved the efficiency of many official drugs, but the most outstanding was that of Digitalis, which is used as much as any drug in a hospital. Most physicians have a favorite proprietary Digitalis preparation, so the opportunity to demonstrate the action of a standardized Powdered Digitalis was easily accomplished with wonderful results and much satisfaction. They also like to change their vehicles and they are now using some that they never before knew were official, such as Syrupus Cacao, Syrupus Idæi, etc.

The Internes particularly appreciate the Formulary as it affords them every opportunity to prescribe. They also use the same for reference purposes as to action of drugs.

The Nurses are also pleased because they use the Formulary in their studies.

Since it is one of the functions of a Superintendent to keep down costs, it is not necessary to elaborate on his reactions but I briefly want to say that the Superintendent once said in his monthly report: "The installing of our new drug department not only permits our Staff and Internes to practice better medicine but also has been the means of lowering costs." Our drug bills now prove to be $200 less a month than heretofore.

After having this Formulary copyrighted, more than 50 requests were received from different hospitals throughout the country but particularly from the northern section, east of Chicago. I have in most instances forwarded a copy, also a Chart, and in a few cases have permitted them to make copies of the Chart, hoping that it would be the means of creating positions for Pharmacists, and of impressing the American College of Surgeons and the American Medical Association with the importance of including a Pharmacist with their other requisites for a Class "A" rating for hospitals.

PILLS AND TABLETS FOR INTESTINAL MEDICATION.

Drugs that have to pass through the stomach unchanged, but which must dissolve readily in the intestinal secretions, have in the past been coated with keratin or acted upon by formaldehyde. Cellulose esters and ethers have also been suggested, but they are unsuitable in the pure state. They are rendered suitable by a newly patented process, which consists of embedding particles of a substance more easily attacked by intestinal ferments in cellulose ester substance. Examples of embedding materials are fats, oils, waxes, lipoids and bile acids. When added to a cellulose ester or ether the latter becomes readily soluble in intestinal ferments. For example, the drug mixture may first be mixed with the pill-forming substance or filler, and then the pills are dipped into a solution consisting of equal parts of 5 per cent nitrocellulose and 5 per cent olive oil in an alcohol-ether mixture. A rapidly hardening skin is obtained over the pills. The pills may be coated with a thin sugar-gelatin layer and then dipped into a solution of 5 per cent cellulose acetate and 5 per cent castor oil in acetone. Capsules may also be made from a mixture of 5 per cent nitrocellulose and 5 per cent lecithin dissolved in equal parts of alcohol and ether. The capsules are then filled with the drug. They will not dissolve in the stomach, but will readily dissolve in the intestines.—(*Drug and Cosmetic Industry*, 4 (1933), 471.)

EDITORIAL NOTES

Because of removal from Baltimore to Washington, of Association Reports, which required many pages, publication of a number of papers and items in this Section had to be deferred. We hope to have the work properly adjusted for the next issue of the JOURNAL.

THE BRITISH PHARMACOPŒIA.

The Pharmacopœia Committee (British) of the General Medical Council reports that the Pharmacopœia Commission took office on October 1, 1933, and since then have held two meetings. They have arranged the allocation of the work of revision among the members of the Commission, and have drawn up a provisional scheme for the formation of Sub-Committees to conduct investigation and inquiry on special subjects germane to Pharmacopœia revision. They have under consideration a proposal for the preparation of an Addendum to the British Pharmacopœia, 1932, which shall include any changes in the standards of the British Pharmacopœia, 1932, which may, after due consideration, be thought necessary, together with monographs on such new drugs as may be considered suitable for official description.

The Commission now has its own research laboratory. The total number sold of copies of the recent revision of the British Pharmacopœia is 33,095; *i. e.*, according to the last report we have seen, which number is, doubtless, much larger by this time.

MEMORIAL TO HENRY GEORGE GREENISH.

The Council of the British Pharmaceutical Society of the School of Pharmacy Students' Association have formed a committee to decide upon and raise a fund for a memorial to the late Henry George Greenish, which will be in addition to the formal memorial to be set up by the Council.

Professor Greenish was a member of the Society's School of Pharmacy for about 50 years and active in all British pharmaceutical affairs. He was an honorary member of the AMERICAN PHARMACEUTICAL ASSOCIATION (see Obituary, page 925, volume XXII). Subscriptions may be sent to the Joint Honorary Treasurer, 17 Bloomsbury Square; remittances are to be made payable to the Greenish Memorial Appeal Committee.

PLAQUE OF DR. LONG PRESENTED TO MURPHY MEMORIAL.

The Fellows of the American College of Surgeons living in Georgia presented a bronze plaque bearing the likeness of the late Dr. Crawford Williamson Long, discoverer of ether anesthesia, to the John B. Murphy Memorial Building, Chicago, Ill. The plaque, which reposes in a niche in that building, was appropriately unveiled before the Clinical Congress of the American College of Surgeons.

VANCOUVER DRUGGISTS UTILIZE DRUG STORE SURVEY REPORT.

At a recent meeting of retail druggists of Vancouver, B. C., it was announced that the executive committee had mailed to all members a bulletin entitled, "Druggists Show Wide Variance in Pricing Prescriptions." The bulk of the text of this bulletin was based on a report evolved from the national drug store survey entitled "The Professional Pharmacy." The Canadian association closed the bulletin by stating that druggists would profit by following the suggestions dealing with prescription prices. Reprints of "The Professional Pharmacy" (price 25 cents) are being prepared, and may be obtained from the AMERICAN PHARMACEUTICAL ASSOCIATION, 2215 Constitution Ave., Washington, D. C.

TREATMENT OF NARCOTIC DRUG ADDICTS AT FEDERAL NARCOTIC FARMS.

A new experiment in the treatment of drug addicts will be made possible when the Federal narcotic farms at Lexington, Ky., and Fort Worth, Tex., now under construction, are completed and the 1800 drug addicts in Federal prisons are transferred to them.

Under the supervision of the Public Health Service, it is planned to develop these institutions as research centers for the treatment of addicts. An advantage which they will have over private institutions of a similar nature, it is pointed out by officials of the Service, is that any program decided upon can be enforced upon those receiving treatment.

The Service finds that the causes of narcotic drug addiction are of three types. Approximately 70 per cent of the present-day addicts took up the use of narcotics because of contacts with other addicts; chronic and painful illness was responsible for about 25 per cent; and the remaining 5 per cent are due to other causes—curiosity, fatigue and the like.

Mental attitude and a predisposition toward use of drugs are responsible for about three-fourths of present-day addiction, according to the Service.

The Service concludes that various experiences indicate that a narcotic addict, with a normal mental background, will not long continue as an addict, for narcotism is unnecessary for the comfort of one who enjoys good mental health.

AGAR EMULSION OF HEAVY LIQUID PETROLATUM.

Heavy Liquid Petrolatum	500.0 cc.
Agar	5.5 Gm.
Sucrose	120.0 Gm.
Acacia, in fine powder	30.0 Gm.
Tragacanth, in fine powder	4.0 Gm.
Tincture of Vanilla	8.0 cc.
Tincture of Lemon	2.0 cc.
Oil of Cassia	0.5 cc.

Water, a sufficient quantity to make 1000 cc

Dissolve the agar and sucrose in 300 cc. of boiling water, and strain the liquid through gauze into a suitable vessel. Set aside until it is cool but not jellied. Incorporate the powdered gums in a capacious mortar with the heavy liquid petrolatum. Then gradually add the agar solution, thoroughly mixing the liquids with the aid of an egg beater. Finally add the tinctures and oil of cassia and sufficient water to make the product measure 1000 cc.—"A. Ph. A. Recipe Book," page 197.

TWO NEW JERSEY LAWS.

Robert P. Fischelis comments on two New Jersey laws in the following:

The New Jersey hypnotic drug law represents the first attempt on the part of any state to limit the dispensing of drugs and preparations containing barbital, chloral hydrate, paraldehyde, sulphonal, trional, tetronal, carbromal and chlorbutanol to prescriptions of physicians, dentists or veterinarians. One of the effects of this law is to automatically curtail the sale of these products in stores which do not have a prescription department operated or managed by a Registered Pharmacist.

The prescription law definitely establishes a routine for compounding, recording, filing and dispensing prescriptions. It will be noted that the regulations prescribe the equipment and apparatus required or the establishment of a prescription department, and it is authorized under the law to establish tolerances for prescription work. This is the first time that a Board of Pharmacy has been authorized to make regulations for the establishment of tolerances to allow for deviations from the amounts of ingredients prescribed, due to manipulative procedures and deterioration. Dr. Fischelis states that this prescription law and the regulations will go a great distance toward safeguarding the compounding of prescriptions and restricting it to properly qualified pharmacists.

NRA PREPARES TO ORGANIZE INDUSTRY FOR ADMINISTERING OF APPROVED CODES.

The Washington correspondent of the *Oil, Paint and Drug Reporter* states that plans for transforming the National Recovery Administration and the trade associations operating under it from code-drafting organizations into code-administering organizations have been virtually completed and will be announced in tentative form within a few days.

Following this a general congress of all code authorities, 150 or more, will be called in Washington, probably about February 15th. This group will discuss with Administrator Hugh S. Johnson and his staff the many problems involved in operating under an approved code. Formal promulgation of rules governing code authorities will not be made until after this gathering.

Meanwhile, the NRA is giving properly organized code authorities the temporary power to handle trade practice violations and complaints. Permanent plans, however, call for retaining enforcement powers in the hands of the government.

LOS ANGELES FLOOD.

The California flood caused large property loss and damage, especially in the Montrose-Glendale section of the Los Angeles suburbs. Comparatively small loss was sustained by the druggists, but to their credit good service was rendered by the pharmacists in serving others with first aid and medicines.

NEBRASKA ASSOCIATION.

The 53rd annual convention of the Nebraska Pharmaceutical Association will be held at Omaha, May 7th–9th, with headquarters at the Paxton Hotel. The date of the convention is one month earlier than that of previous years.

GOLDEN ANNIVERSARY MINNESOTA PHARMACEUTICAL ASSOCIATION.

Minnesota will celebrate for nearly a week, commemorating the fiftieth anniversary of its organization. Tuesday, February 13th—addresses will be made by Mayor Bainbridge; President-Elect of Montevideo, Theodore A. Arneson; O. P. Cleaver, who had a large part in arranging the lighting effects at A Century of Progress. Opening of the Drug Show by President J. P. Jelinek. Banquet.

Wednesday—Scientific and Practical Section, Northwestern Branch, A. PH. A., under direction of Dean Wulling. President's reception and ball.

Thursday—District Meetings, banquet.

Friday—Conclave of Veteran Druggists, social gatherings and various district meetings.—Hugo O. Peterson is chairman of the Committee on Arrangements.

PERSONAL AND NEWS ITEMS.

Dr. George Barger—well and favorably known for "high excellence in the prosecution or promotion of original research in the Chemistry and Natural History of Drugs"—has been awarded the Hanbury Medal. Dr. Barger is author of "Ergot and Ergotism;" he is a member of the faculty of Edinburgh University.

The University of Paris has conferred the Doctor's degree on **Prof. L. Van Itallie,** University of Leyden. He is an honorary member of the AMERICAN PHARMACEUTICAL ASSOCIATION. Dr. Van Itallie is president of the technical commission of the League of Nations for the standardization of the analysis of opium; he is professor of toxicology and pharmaceutical chemistry, University of Leyden.

Dr. John Jacob Abel, in his presidential address before the American Association for the Advancement of Science, included the following striking statements:

"We ourselves are walking drug shops. An experienced chemist or pharmacist would have no difficulty in preparing arrow poisons from some of our own organs that would have delighted the heart of primitive man. I incline to the belief that no living cell exists whose contents or metabolites are not toxic to some other living cell."

Prof. Heber W. Youngken, of the faculty of the Massachusetts College of Pharmacy, presented two papers during the convention of the American Association for the Advancement of Science held in Boston. The first of these was entitled "An Investigation of the Viburnums and Their Medical Aspects" which was given before the Section on Medical Sciences, at the Boston Medical Library on Friday, December 29th. The second, delivered before the General Section of the Botanical Society of America, at Mallinckrodt Hall, Harvard University, on December 30th, was entitled "A Comparative Study of the Seeds and Spikes of Certain Caulescent Species of Plantago." Both papers were illustrated with the lantern.

Prof. Marston T. Bogert, head of the department of organic chemistry at Columbia University, has been appointed a member of the Board of Directors of the Florida Research Institute, whose headquarters are at Eustis, Florida.

Colonel Samuel Price Wetherill, Jr., president of the Philadelphia Art Alliance and member of the executive committee and former president of the Tri-State Regional Planning Federation, was elected chairman of the Board of Trustees of the Philadelphia College of Pharmacy and Science at a meeting of the trustees January 9th. He succeeds Joseph W. England, who had been chairman from 1924 until his death December 2nd. He is the great great nephew of Samuel Price Wetherill who was the presiding officer at the meetings of the Philadelphia College when it was organized in Carpenter's Hall, Philadelphia, in 1821.

Dr. R. L. Swain was speaker at the meeting of the Maryland Academy of Medicine and Surgery on January 15th. The address was under the auspices of the U. S. P. and N. F. Publicity Committee—the subject of Dr. Swain was "The U. S. P. and N. F.—Their Relationship to the Costs of Medical Care."

Ambrose Hunsberger has resigned as member of the N. A. R. D. executive committee.

Governor Albert C. Ritchie, of Maryland, in an address, said:

"A great many people, of whom I happen to be one, still believe that the business stability of this nation depends upon the self-reliance

and initiative, the energy and unfettered industry of independent men, and that our national happiness and prosperity will not survive if the independent merchant—the grocery store, the drug store, the retail store, the corner store and the neighborhood store—are overwhelmed by mass wealth and by giant size and power."

Prof. Karl Sudhoff, formerly of the University of Leipzig, where he held the chair of History of Medicine, celebrated his 80th birthday, November 26th. Lately, he has devoted his chief energies to research on Paracelsus, whose medical writing he is publishing in an imposing edition.

John O'Brien, Omaha pharmacist, Pharmacy Week prize winner of 1932, has developed the professional side of his drug store—the returns from prescriptions represent 50% of the total volume of the gross income. The soda fountain is Mr. O'Brien's hobby and represents one-third of the total sales volume.

E. V. Lynn spoke before Phi Sigma, Washington State University, at its recent meeting on "Biology in Relation to Drugs."

Dean C. W. Johnson, who became seriously ill on the train bound for the Madison A. PH. A. meeting, has taken up his work as dean and on the faculty.

G. H. P. Lichthardt is now connected with California Department of Public Works (Research Department). He, recently, spoke to the students of the University of California on the opportunities of trained pharmacists in non-pharmaceutical occupations.

Anton Hogstad, chairman of National Week Committee, writes that within the next five years there will be a marked change in American Pharmacy. He is convinced that the trend of pharmacy is definitely toward a revival of the professional in pharmacy. He holds that many important factors should be receiving attention—professional window displays, personal contact with physicians, consideration of the advantages of an open-view prescription department, a professional library and methods for promoting the professional phases. The trend should be to the fundamentals of pharmacy and emphasis should be on quality and service.

Walter J. Hartung addressed the annual meeting of Columbia University College of Pharmacy January 16th, on "Changing Styles in Modern Materia Medica."

J. A. Porter, Lincoln, Neb., has been appointed member of the Nebraska Board of Pharmacy.

Prof. Alexander Tschirch, of Bern, Switzerland, celebrated his 77th birthday on October 17th. Many of the prominent leaders in European pharmacy called at his home to extend congratulations. This visit was arranged by Dr. Ferchl of Mittenwald, who is well known on account of his famous pharmaceutical calendar which has been published for many years.

Prof. Tschirch was formerly head of the Pharmaceutical Institute in Bern, the new building for which was recently dedicated. He is an honorary member of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Dr. Horatio N. Fraser, pioneer in the tablet triturate industry, received the congratulations of the New York Veteran Druggists on his 82nd birthday, November 30th.

Mrs. John F. Hancock and Mrs. Charles E. Dohme (Baltimore), widows of A. PH. A. ex-presidents, celebrated their 93rd birthdays this month. All good wishes are extended.

Our fellow-member, **Vladko Bartulic,** is owner of the pharmacy in Zagreb, Jugoslavia, dating back to 1599. Recently Mr. Bartulic refurnished the pharmacy throughout. He has photographs of nearly every owner, and these with sketches are collected in a 36-page booklet, published as part of the celebration of the 333rd anniversary of the establishment.

Theodore D. Wetterstroem issued a publicity statement in which he stressed the importance of the pharmacist in public health service. He dwelt with particular emphasis on the general adherence of pharmacists to standards.

Leo G. Penn, a member of the faculty of Temple University Pharmacy School, was elected president of the Philadelphia Association of Retail Druggists at the annual meeting of the organization.

Hugo Kantrowitz, former editor of New York *Apotheker Zeitung*, was elected *honorary president* of the New York Veteran Druggists' Association.

James H. Beal, E. Fullerton Cook, Samuel L. Hilton, E. F. Kelly and Samuel C. Henry attended a meeting of the Board of Trustees, U. S. Pharmacopœia, in Washington, during the week of January 22nd. They also conferred on the food and drug bills now in Congress, in the consideration of which they were joined by **President R. L. Swain,** of the A. PH. A.

OBITUARY.

BARNETT MILLER.

Barnett Miller, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, died January 3rd, aged 61 years, of pulmonary embolism, following an automobile accident.

Mr. Miller was born in Russia, September 22, 1872. He graduated from Brooklyn College of Pharmacy in 1902; won the Junior Medal in 1902, the Brundage Medal in 1903, the post-graduate Gold Medal in 1906, and earned the Phar.D. degree.

Mr. Miller engaged in the drug business on his own account at 53rd St. & Third Ave., and was secretary of Ormant Drug & Chemical Company at the time of his death. He was financial secretary of New York Retail Druggists' Association for about 14 years, served as its treasurer for 2 years and for one year as its president. He was a member of New York Pharmaceutical Association, New York Apothecaries' Association, Drug and Chemical Square Club, and held important offices in other drug and pharmaceutical organizations.

Mr. Miller was a member of the Masonic bodies, under whose auspices the funeral services were held.

The deceased is survived by his wife, a son and a daughter.

H. W. Eddy, Attorney, in fact for the Casualty Indemnity Exchange and the Druggists' Indemnity Exchange, St. Louis, died January 6th.

OTTO WIDMANN.

Otto Widmann, outstanding Missouri ornithologist, died at his home in St. Louis, November 26th, aged 92 years. He was the son of a German naturalist and came to the United States as a young man; he engaged as a drug clerk and later, for many years was proprietor of a St. Louis pharmacy. For about sixty years he carried on the studies which have made him known throughout the world; his writings became textbooks and many naturalists followed in his footsteps. It is said he knew birds as few persons know them; he was the first student, in his section, to welcome the return of his feathered friends and the last to bid them goodby. He retired from the drug business about 30 years ago, so that he could devote all of his time to studies.

L. C. BRENNER.

Just before closing forms for the January JOURNAL we are advised by Walter D. Adams of the death of L. C. Brenner of Gonzales, Tex., president of Texas Pharmaceutical Association, 1932–1933. Further notice will be made in the February JOURNAL.

DR. KEIZO IKEGUCHI.

Dr. Keizo Ikeguchi died at his home on December 1st. He was a member of the Commission on Japanese Pharmacopœia, president of the Japanese Hygienic Chemical Society and president of Tokyo College of Pharmacy. He was a graduate of Tokyo Imperial University and associated with every movement for the advancement of pharmacy in Japan.

LEGAL AND LEGISLATIVE.

WHERE IS THE FINAL RESPONSIBILITY FOR THE EFFICIENT ADMINISTRATION OF CODES?

Frank S. Pollak, Counsel, states that the final responsibility rests with NRA. A code, when once approved by the President, becomes a law of the United States, and it is the duty of the Government to see that it is carried out. NRA will therefore supervise code administration by code authorities but it is the aim of NRA to help industry develop its own agencies of self-government and to give to the Code Authority in each industry as much responsibility as it is able to take in the administration of its code.

AN EXECUTIVE ORDER SEEKS TO PROTECT THE SMALL DEALER.

President Roosevelt has issued an executive order intended to protect the small business man against monopolies in conforming with the requirements of the codes under the national recovery act. To eliminate discrimination against small enterprises, the President's order makes it possible for complainants operating under the codes to go before the Federal Trade Commission or to the Department of Justice for redress.

Under such a method grievances can be adequately aired and settled by disinterested governmental agencies, in accordance with the

principles set forth in the recovery legislation. According to the President's order, the Federal Trade Commission, in handling such complaints, will follow the procedure set forth in its organic act. In the event the nature of the complaint is such as to be beyond the jurisdiction of the Federal Trade Commission, the President's order makes it possible for the complainant to take his grievance to the Justice Department.

DRUG CONFERENCE BILL IN SENATE.

The National Drug Trade Conference Bill to amend the present food and drugs act was introduced in the senate by Senator H. D. Stephens of Mississippi.

The bill is the same as that introduced in the house by Representative Loring Black. It bears the number S. 2355, and was introduced by the Senator "by request." Senator Stephens is chairman of the Senate Committee on Commerce, which also has before it the revised Tugwell food and drug bill sponsored by Senator Royal S. Copeland of New York.

The special committee of the conference, appointed at the last annual meeting to promote reasonable revision of the food and drugs act, met in Washington January 24th, to discuss the various bills offered for such revision.

LEGALITY OF RETAIL AUCTIONING OF DRUGS QUESTIONED.

Assistant Attorney General G. C. A. Anderson holds that retail auctioning of drugs and drug preparations cannot be held outside of a pharmacy under the pharmacy and drug laws of Maryland. In his opinion:

"The pharmacy and drug laws of this state contain various provisions regulating pharmacies, many of which are for the protection of the public against indiscriminate sale of poisonous drugs or harmful medicines. None of these provisions is complied with or even remotely fulfilled in a sale of this character.

"Therefore, it is my opinion that the auction sale of drugs, as outlined, cannot be held under the pharmacy and drug laws of this state."

BOOK NOTICES AND REVIEWS.

Illustrierter Apotheker Kalender 1934—Illustrierter Apotheker Kalender 1934, prepared by Dr. Fritz Ferchl, Mittenwald, Germany, price 75¢.

This annual publication is always welcome. This issue is the ninth, and is full of historical material, beautifully illustrated. Quite a number of drug jars of various periods are shown; on one page prescriptions of the father of the poet Schiller are reproduced. Quite a number of old apothecary shops are among the illustrations, and apparatus of the eighteenth century. Then follow pictures of pharmacies in which the regligious thought enters. There are also quite a number of mortars of various periods. A picture of the old E. Merck pharmacy—The Engel Apotheke. Throughout the Kalender will be found much interesting historical information. Those who have had an earlier copy of this Kalender will, no doubt, desire the one for 1934.

The Medicinal and Poisonous Plants of Southern Africa. By John Mitchell Watt, M.B., Ch.B., professor of Pharmacology in the University of Witwaterstrand, Johannesburg, and Maria Gerdina Breyer and Brandwijk, formerly lecturer in Pharmacology and research worker in Phytochemistry in the Department of Pharmacology, University of Witwaterstrand, Johannesburg. Published by Wm. Wood & Co., Baltimore. This volume of more than three hundred pages contains twelve illustrations in color and twenty in black and white. It gives an account of the medicinal uses, chemical composition, pharmacological effects, and toxicology in man and animals of the medicinal and poisonous plants of Southern Africa. One hundred twenty-eight plant families are represented and many of them are described at length and others briefly. The aim has been to give all the available information on the medicinal uses, chemical composition, pharmacological effects, and human and veterinary toxicology of the flora of Southern Africa. The book forms a useful basis for new work and its publication may prevent overlapping and repetition by other workers in this field. The authors hope that the medical practitioner, the pharmacist, the missionary, the forensic workers and the scientist will find it of value in their several spheres.

The indices give botanical names of the plants, common names from European lan-

guages, native names and active principles; obsolete names have also been recorded. The authors have given the results of research relating to the plants; they are deeply indebted to the station of the Division of Plant Industry at Pretoria for determining the plant specimens which number over twenty-five hundred.

Allan's Commercial Organic Analysis, Volume X, published by P. Blakiston Son & Co., Inc., Philadelphia, Pa.

Preceding volumes of this valuable publication have been reviewed in the JOURNAL and all of the commendatory references made heretofore apply to this volume. It is well bound and printed and covers more than 800 pages.

Volume X is devoted to Haemoglobin and Its Derivatives, Albuminoids or Scleroproteins, Structural Proteins, Examination of Foodstuffs for Vitamins, the Hormones, the Identification of Unknown Woods and Charcoals, the Pectic Substances.

The Editor is C. Ainsworth Mitchell of the *Analyst*, consulting chemist of London and other contributors are: J. Addyman Gardner, G. A. Buckmaster, J. Alexander, W. P. Dreaper, R. H. Marriott, J. C. Drummond, Katherine Coward, K. Culhane, S. W. F. Underhill, J. C. Maby, H. W. Buston and M. B. Elliott. This volume completes the fifth edition of "Allan's Commercial Organic Analysis," and as the Editor states, the subjects treated have become more miscellaneous in character than the preceding editions. It is hardly possible for a chemist to carry on his researches without this work and this applies also to those doing research in pharmacy. This volume contains the *general index*. As stated, this publication is so generally and favorably known that it is unnecessary to extend this notice.

Spezialitäten Taxe, published by the German Apothecaries Society. This comprehensive index of more than twelve hundred pages lists all medicinal preparations in the various forms represented on the market, proprietary preparations, officials, etc. Those coming under specific legislation, as narcotics are designated; also, the purposes for which they are used and the industry or profession employing them. In other words, the information given is of value to all pharmacists, druggists, manufacturers and dealers.

It is a German publication but can readily be used as reference by all engaged anywhere in the drug industry. The tabulation gives the information required on all preparations, as far as purchase and selling prices are concerned. The first column notes whether the product comes under specific legislation, the next column gives the wholesale price followed by the name of the preparation, form and other descriptive matter. The next column describes the package; then follows the selling price without tax or duty and then the selling price with tax or duty. Several columns enable the user to make additional references.

This is the fifteenth edition of the book which speaks for the usefulness of the publication; in so far as its purpose is concerned the publication deserves commendation. The price is R. M. 20.00.

FEDERAL FOOD, DRUG AND COSMETIC ACT.

Representatives of the National Drug Trade Conference held meetings during the week of January 22nd, and in conference with Charles Wesley Dunn framed a new bill which corrects the defects and undesirable features of other bills in Congress. Representatives of the food and cosmetic industries have signified their approval and willingness to back the measure and it is hoped that Senators Copeland and Stephens, and Representative Loring Black will find the measure acceptable, so that there may be unison in the promotion of the new bill.

The object of the bill is stated to be for the purpose of preventing adulteration, misbranding and false advertising of food, drugs and cosmetics, in the commerce affected, for the following purposes, namely, to safeguard the public health and to protect the purchasing from injurious deception. The suggested title of the bill is given as "Federal Food Drug, and Drug and Cosmetic Act."

WINNER OF THE NATIONAL PHARMACY WEEK CONTEST.

We are in receipt of a *Bulletin* of the National Pharmacy Week Executive Committee, Anton Hogstad, Jr., *Chairman*, through which we are advised that O. U. Sisson, well and favorably known Chicago pharmacist, has been awarded first place in the 1933 National Pharmacy Week Window Display Contest. Honorable mention is made by the Committee of: C. Thurston Gilbert, Noroton Heights, Conn.; S. M. Leoncavallo, Wilmington, Del.; H. Dratzka, South Milwaukee, Wis.; Emerichs Pharmacy, Orlando, Fla.